INTERROGATORY RESPONSE - EPRF-1

1-EP-1

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Sch. 10; OEB Handbook of Utility Rate Applications, October 13, 2016, page 26

SUBJECT AREA: Custom Incentive Rate-Setting Framework

Preamble:

"The index must be informed by an analysis of the trade-offs between capital and operating costs, which may be presented through a five-year forecast of operating and capital costs and volumes. If a five-year forecast is provided, it is to be used to inform the derivation of the custom index, not solely to set rates on the basis of multi-year cost of service. An application containing a proposed custom index which lacks the required supporting empirical information may be considered to be incomplete and not processed until that information is provided."

a) Please confirm that Hydro Ottawa's five-year forecast of capital expenditures is used to set rates on a multi-year basis. Please explain your answer.

b) Please confirm that Hydro Ottawa's five year forecast of capital expenditures has not been used to inform the derivation of a custom index. Please explain your answer.

c) Please explain how Hydro Ottawa's proposed Custom Incentive Regulation plan provides incentives for the containment of capital and OM&A expenditures?

d) Please explain how Hydro Ottawa's proposed Custom IR plan differs from multi-year cost of service.

e) Please explain how Hydro Ottawa's Custom IR plan addresses trade-offs between capital and operating costs.

RESPONSE:

a) Yes, Hydro Ottawa confirms that its five-year forecast of capital expenditures is used to set rates on a multi year basis. As noted in the response to interrogatory OEB-3 part (a), Hydro Ottawa undertook a rigorous capital expenditure prioritization process. (For more details, please see UPDATED Exhibit 2-4-1: Capital Expenditure Summary). Through this process, the capital expenditure levels were reduced by approximately $50M per year during the 2021-2025 period. As indicated in UPDATED Exhibit 2-4-1, the initially proposed expenditures were prioritized through a process that considered customer impacts (including growth), financial impacts, asset needs, resourcing considerations, system reliability (including aging infrastructure) and health and safety considerations. Some of the $50M annual savings were achieved by building productivity savings into the capital program over the 2021-2025 period. For more information on the utility's planned productivity activity, please see Exhibit 1-1-13: Productivity and Continuous Improvement Initiatives.

b) Hydro Ottawa can confirm that its five-year forecast of capital expenditures has not been used to inform the derivation of the Custom IR index. For further details, please see the response to part (a) above.

c) As stated in UPDATED Exhibit 1-1-10: Alignment with the Renewed Regulatory Framework and UPDATED Exhibit 4-1-1: Operations, Maintenance and Administration Summary, Hydro Ottawa applied a custom OM&A productivity escalator to its planned 2021 OM&A levels. The custom escalator applied was 2.51%. The application of this custom escalation factor resulted in a reduction to OM&A spending over the 2021-2025 rate term of approximately $13.1M, relative to the cost of service OM&A levels in each year. These savings will be achieved in large part through productivity and continuous improvement efforts, as described in Exhibit 1-1-13: Productivity and Continuous

Improvement Initiatives.

Based on the above discussion, Hydro Ottawa is confident that it has proposed a reasonable target for OM&A productivity.

Capital expenditures have been contained over the 2021-2025 term through the measures outlined in the response to part (a) above.

d) As outlined in UPDATED Exhibit 1-1-10: Alignment with the Renewed Regulatory Framework, there are several core features of Hydro Ottawa's 2021-2025 application which distinctly fit the mould of a Custom IR rate filing. To begin, the proposed rate framework is anchored in a five-year forecast of the utility's costs and sales, as required by the OEB's *Handbook for Utility Rate Applications*.[1] Secondly, Hydro Ottawa's proposed rates are adjusted using a formulaic approach in the years following the first year base rates. This formula consists of a customized, two-component Price Cap Index ("PCI"): inflation and productivity. Productivity is comprised of two factors for productivity – one is a fixed value for industry-wide productivity, while the other is a stretch factor. In the context of Hydro Ottawa's 2021-2025 rate application, the stretch factor is based on total cost benchmarking analysis prepared by an independent expert, Clearspring Energy Advisors (please see Attachment 1-1-12(A): Econometric Benchmarking Study of Hydro Ottawa's Total Cost and Reliability).

Under a Custom IR approach, the annual rate adjustment must be based on a custom index supported by empirical evidence that can be tested. The annual adjustment must include explicit financial incentives for continuous improvement and cost control targets. As noted in the OEB's *Handbook for Utility Rate Applications*, "these incentive elements, including a productivity factor, must be incorporated through a custom index or an explicit revenue reduction over the term of the plan (not built into the cost forecast)."[2]

[1] Ontario Energy Board, *Handbook for Utility Rate Applications* (October 13, 2016), page 24.
[2] *Ibid*, page 25.

As a result, Hydro Ottawa is proposing to adopt a **C**ustom **P**rice **E**scalation **F**actor ("CPEF") rate framework for years two through five, which is based on the approach approved by the OEB in the utility's 2016-2020 Custom IR application.[3] This framework is aligned with OEB policy and based on sound ratemaking principles. The CPEF incorporates the OEB's key principles and expectations of a Custom IR application, and thus has been structured in a way that:

- Includes productivity gains as part of the rate adjustment mechanism;
- Constrains operational funding increases going forward at approximately the rate of inflation; and
- Acknowledges the funding requirements to address Hydro Ottawa's significant, multi-year investment needs over the 2021-2025 period.

In contrast to the foregoing description, a Cost of Service application for the 2021-2025 period would look very different. Most significantly, Hydro Ottawa's distribution rates would be established on a single forward test-year cost of service basis and then indexed by a standardized price cap formula. Moreover, this formula would not embed any financial incentives for continuous improvement.

Other examples of how Hydro Ottawa's application differs from a multi-year cost of service are the inclusion of mechanisms to protect customers from any excessive earnings gained by the utility (e.g. earnings sharing mechanism); the inclusion of numerous benchmarking studies examining diverse aspects of the utility's business and operations; and the large and variable nature of the capital investment needs forecasted by the utility over the five-year rate term. (The OEB has consistently signalled its expectation that 4th Generation Incentive Rate-setting through the submittal of Cost of Service applications represents the most appropriate rate-setting method for distributors which anticipate modest, incremental needs arising over the course of their rate term).[4]

[3] Ontario Energy Board, *Decision and Order*, EB-2015-0004 (December 22, 2015), page 1.
[4] Ontario Energy Board, "Report of the Board - Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach" (October 18, 2012), page 14.

e) Hydro Ottawa's Custom IR plan addresses trade-offs between capital and operating costs in several ways. First, it does so in the context of the extensive customer outreach that was conducted to help inform the development of the utility's capital and operating plans. In engaging its customers, Hydro Ottawa sought their input on the preferred approach for the utility to invest in various capital and operational programs, and presented the trade-offs inherent in the different options for pacing and prioritizing these investments.[5]

A second key method is the capital expenditure processes utilized by Hydro Ottawa to define project concepts and alternatives, and to evaluate project risks, benefits, and costs. An essential element of this process is identifying both the operations and maintenance costs and savings associated with a given capital project, and incorporating those into the overall assessment of the project's value.[6] What's more, the template prepared by Hydro Ottawa to structure its proposals for projects representing material capital investments ensures that, among other things, trade-offs between capital and operating costs are appropriately examined in any evaluation of a project and its potential alternatives (e.g. through discussion of the consequences of deferring a project). An illustrative example in this regard is the Material Investment Plan for the Advanced Metering Infrastructure Analytics and Integration Enablement project in the General Plant category.[7] Therein, the need to reduce OM&A costs is cited as a key business driver for the project, with the trade-offs between project investment and operational efficiencies featuring prominently throughout the analysis.

[5] For more details, please see Attachment 1-2-2(A): Innovative Research Group - Customer Engagement Report on Hydro Ottawa's 2021-2025 Rate Application.
[6] For additional details, please see section 5.2 of Exhibit 2-4-3: Distribution System Plan.
[7] For further information, please see section 3.6.2 of Attachment 2-4-3(E): Material Investments.

INTERROGATORY RESPONSE - EPRF-2

1-EP-2

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Sch. 10, page 20

SUBJECT AREA: Custom Incentive Rate-Setting Framework

a) Did Hydro Ottawa seek OEB approval for a growth factor G in its previous Custom IR application, EB-2015-0004? If the answer is no, please explain why not. If the answer is yes, please explain what has changed that would make a growth factor necessary now?

b) Please explain how the OEB can be confident that the use of the growth factor G does not result in double recovery of customer related capital and OM&A costs.

RESPONSE:

a) As a result of the settlement process associated with Hydro Ottawa's 2016-2020 Custom IR application, a growth factor of +0.14% was assigned. A copy of the Approved Settlement Agreement governing the utility's 2016-2020 rate term is available on both the Hydro Ottawa and OEB websites.[1]

b) As outlined in UPDATED Exhibit 1-1-10: Alignment with the Renewed Regulatory Framework, Hydro Ottawa's CPEF includes a growth factor to account for the increased costs associated with its substantial and steady customer growth. The inclusion of a growth variable in the CPEF is warranted in order to capture the change in distribution revenue that would naturally occur (in the absence of any rate changes) as a result of an increase in the number of customers over the forecast period. The value of the growth factor is determined based upon Hydro Ottawa's historical and forecast growth in customers for the period 2012-2020.

[1] https://hydroottawa.com/about-us/regulatory-affairs/archives.

INTERROGATORY RESPONSE - EPRF-3

1-EP-3

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Sch. 10, page 13

SUBJECT AREA: Custom Incentive Rate-Setting Framework

Preamble:

After an analysis of both historical and forecast operations, maintenance and administration ("OM&A") expenditure data over the 2016-2020 period, Hydro Ottawa has determined that a unique labour/non-labour weighting of 55.5% labour and 44.5% non-labour is appropriate.

a) Please explain why the labour/non-labour weighing for Hydro Ottawa is different than the weighing for other electricity distributors in Ontario?

b) Is Ottawa's labour/non labour weighting the same for Capital and OM&A expenditures? If the answer is yes, please explain why that is the case. If the answer is no, please provide the labour/non-labour weighing for each one.

RESPONSE:

a) Every electricity distributor will have a different weighting of labour and non-labour that reflects its unique situation, including, but not limited to, the amount of outsourcing as well as the volume of capital versus OM&A projects.

b) Hydro Ottawa's labour/non labour weighting is not the same for capital and OM&A expenditures. Please see Table A below which provides the utility's labour and non-labour components and Labour as a percentage of gross capital expenditures. For the labour and non-labour split in OM&A expenditures, please see UPDATED: Exhibit

1-1-10: Alignment with the Renewed Regulatory Framework, Table 3 - Hydro Ottawa's Labour/Non-Labour Split (2016-2020).

Table A – Hydro Ottawa's Labour/Non-Labour Split for Capital (2016-2020)
($'000,000s)

	2016	2017	2018	2019	2020	5-Year Total
Labour	$22.3	$23.4	$21.4	$21.0	$22.0	$110.1
Non-Labour	$96.2	$114.5	$160.9	$119.7	$137.3	$628.7
Gross Capex	$118.5	$137.9	$182.3	$140.7	$159.3	$738.8
Labour as a % of Gross Capex	19%	17%	12%	15%	14%	15% (average)

INTERROGATORY RESPONSE - EPRF-4

1-EP-4

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 10, Section 4.4.3

SUBJECT AREA: Custom Incentive Rate-Setting Framework

Preamble:

Hydro Ottawa has incorporated a growth factor (*g*) into its proposed OM&A adjustment formula,

$$CPEF = I - \left(X + stretch_{factor}\right) + g$$

a) Has Hydro Ottawa consulted with Clearspring Energy Associates on appropriate growth factors? If so, provide the CEA opinion view(s).

b) Please confirm the customer growth rate 2012-2020 (Table 7)

c) Please provide the growth in OM&A/customer 2015-2020 and calculate the implicit growth factor and AGCR.

d) Please confirm that Hydro Ottawa proposes a g-factor of 0.40%, for OM&A for the CIR Plan.

e) Please confirm the capital portion of costs is not included in the growth factor.

f) Please provide examples where the capital has been included in the growth factor.

g) Please calculate the historic growth in capital/customer and provide an estimate of a capital additions growth factor.

h) Please blend this with the OM&A g-factor to produce a composite g-factor

RESPONSE:

a) No, Hydro Ottawa did not consult with Clearspring on the development of its growth factor.

b) The customer growth rate over the 2012-2020 period is presented in Table 8 of the referenced Exhibit. As shown in Table 8, the Compound Annual Growth Rate ("CAGR") over the 2012-2020 period is 1.34%.

c) The growth in OM&A per customer during the 2015-2020 period, as well as the implicit growth factor and CAGR[1], are shown in Table A.

Table A – 2015-2020 Annual OM&A/Customer with Implicit Growth Factor

Year	OM&A/ Customer	Previous Year	Variance	Implicit Growth Factor
2015	$258	N/A	N/A	N/A
2016	$252	$258	$(6)	(2.36%)
2017	$248	$252	$(4)	(1.62%)
2018	$259	$248	$11	4.50%
2019	$245	$259	$(14)	(5.57%)
2020	$267	$245	$23	9.22%

The CAGR for this period is 0.69%.

d) Hydro Ottawa confirms that it is proposing a g-factor of 0.40% for OM&A for its Custom IR Plan.

[1] Hydro Ottawa has interpreted the interrogatory as requesting CAGR. The original wording refers to "AGCR", the intending meaning of which is unclear to the utility.

e) The growth factor was developed from a customer growth perspective, as outlined in UPDATED Exhibit 1-1-10: Alignment with the Renewed Regulatory Framework (pages 20-24).

f) Please see the response to part (e) above.

g) The historic growth in capital per customer and an estimated capital additions growth factor are presented in Table B.

Table B – 2016-2020 Annual Capital/Customer with Implicit Growth Factor

Year	Capital/Customer	Previous Year	Variance	Implicit Growth Factor
2016	$302	N/A	N/A	N/A
2017	$363	$302	$61	20.27%
2018	$494	$363	$130	35.91%
2019	$341	$494	($153)	(30.95%)
2020	$366	$341	$25	7.30%

h) Table C provides an overview of Hydro Ottawa's Capital and OM&A per customer components, as a percentage of the combined total.

Table C – Hydro Ottawa's Capital/OM&A per Customer Split (2016-2020)

	2016	2017	2018	2019	2020	5-Year Total
Capital/Customer	$302	$363	$494	$341	$366	$1,866
OM&A/Customer	$252	$248	$259	$245	$267	$1,271
Capital as a % of Total	54.51%	59.41%	65.60%	58.19%	57.82%	59.48% (average)

The application of Hydro Ottawa's capital weighting (59.48%, as per Table C) to the implicit capital additions per customer growth factors derived from Table B above is presented in Table D below.

Table D – 2017-2020 Implicit Capital Additions per Customer Growth Factor Index ("ICAGFI")

Year	ICAGFI	Hydro Ottawa Capital Weighting	Adjusted ICAGFI
2017	20.27%	59.48%	12.06%
2018	35.91%	59.48%	21.36%
2019	(30.95%)	59.48%	(18.41%)
2020	7.30%	59.48%	4.34%

The implicit OM&A per customer growth factor derived from Table A above is presented in Table E below, alongside the OM&A per customer weighting derived from Table C above.

Table E – 2017-2020 Implicit OM&A per Customer Growth Factor Index ("IOGFI")

Year	IOGFI	Hydro Ottawa OM&A Weighting	Adjusted IOGFI
2017	(1.62%)	40.52%	(0.66%)
2018	4.50%	40.52%	1.82%
2019	(5.57%)	40.52%	(2.26%)
2020	9.22%	40.52%	3.74%

Table F below presents an annual breakdown of Hydro Ottawa's adjusted weightings for both Capital and OM&A per customer over the 2017-2020 period. The composite g-factor is 5.50%.

Table F – Hydro Ottawa's Capital/OM&A per Customer Split (2017-2020)

Year	Adjusted ICAGFI	Adjusted IOGFI	Total
2017	12.06%	(0.66%)	11.40%
2018	21.36%	1.82%	23.18%
2019	(18.41%)	(2.26%)	(20.67%)
2020	4.34%	3.74%	8.08%
2017-2020 Average	**4.84%**	**0.66%**	**5.50%**

INTERROGATORY RESPONSE - EPRF-5

1-EP-5

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 10, Section 4.4 ESM

SUBJECT AREA: Earning Sharing Mechanism

Please provide examples of other ESMs that have been approved, including Hydro Ottawa:

- By the OEB
- In other Canadian jurisdictions

  Provide dates and references as appropriate.

RESPONSE:

The tables below outline examples of approved Earnings Sharing Mechanisms ("ESMs"). Table A provides OEB-approved ESMs, while Table B provides ESM methodologies in other Canadian jurisdictions.

Table A – OEB-Approved ESMs

Applicant, Date, EB Number	Earnings Sharing Mechanism Decision
Union Gas – Decision and Rate Order: October 7, 2013 (EB-2013-0202)	Asymmetrical ESM – excess earnings between 100 basis points and 200 basis points to be shared 50/50 between Union and customers; excess earnings over 200 basis points to be shared 90/10 between customers and Union.
Enbridge – Decision with Reasons: July 17, 2014 (EB-2012-0459)	All over earnings are shared 50:50 with ratepayers.
Horizon Utilities – Decision and Rate Order: December 11, 2014 (EB-2014-0002)	Asymmetrical ESM with no dead band.
Hydro Ottawa – Decision and Rate Order: December 22, 2015 (EB-2015-0004)	Asymmetrical ESM with no dead band.

Applicant, Date, EB Number	Earnings Sharing Mechanism Decision
Toronto Hydro – Decision and Order: December 29, 2015 (EB-2014-0116)	Symmetrical ESM incorporating a 100 basis point dead band. Earnings in excess of the 100 basis point dead band to be split on a 50:50 basis with ratepayers.
Hydro One Networks Distribution – Decision and Order: March 7, 2019 (EB-2017-0049)	Asymmetrical ESM with earnings 100 basis points over approved ROE shared 50:50 with ratepayers.
Hydro One Sault Ste. Marie Limited Partnership – Decision and Order: June 20, 2019 (EB-2018-0218)	Asymmetrical ESM starting in 2022, adjusting revenue requirement such that the prior year's excess earnings are shared with ratepayers on a 50:50 basis for all earnings that exceed 300 basis points above the approved ROE.
Toronto Hydro – Decision and Order: December 19, 2019 (EB-2018-0165)	Asymmetrical ESM with earnings in excess of 100 base points over approved ROE shared 50:50 with ratepayers.
B2M Limited Partnership – Decision and Order: January 16, 2020 (EB 2019-0178	Asymmetrical ESM with 50% of any earnings exceeding the OEB allowed regulatory ROE by more than 100 basis points in any year of the Revenue Cap IR term.
Niagara Reinforcement Limited Partnership – Decision and Order: April 9, 2020 (EB-2018-0275)	Asymmetrical ESM with 50% of earnings exceeding the regulatory ROE by more than 100 basis points in any year of the Revenue Cap IR term
Hydro One Networks Transmission – Decision and Order: April 23, 2020 (EB-2019-0082)	Asymmetrical ESM with earnings in excess of 100 base points over approved ROE shared 50:50 with ratepayers.

Table B – Approved ESMs in Other Canadian Jurisdictions[1]

Canadian Jurisdiction	Earnings Sharing Mechanism Methodology
Alberta	Scaled, symmetric, with deadband
British Columbia	Symmetric, 50:50
Québec	Asymmetric, 50:50

[1] Elenchus Research Associates, "An International Survey of Performance Based Regulation Mechanisms Approved by Energy Regulators", Appendix 1: Summary of Distribution PBR Mechanisms, (April 26, 2004), page 10. https://elenchus.ca/cerise/library/factinsight/Yannick-International-PBR-Survey-Part-1-April262004.pdf.

INTERROGATORY RESPONSE - EPRF-6

1-EP-6

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 10, Attachment A

SUBJECT AREA: Financial Performance

a) Please provide Hydro Ottawa actual ROE and comparison to the OEB allowed ROE for 2015-2019.

b) Please provide the Actual Debt/Equity Ratios for 2015-2019.

c) Please provide the Dividends paid to the City of Ottawa 2015-2019.

RESPONSE:

a) Please see the response to interrogatory VECC-91.

b) Hydro Ottawa's actual total debt/total equity ratios for 2015-2019 are shown in Table A.

Table A – 2015-2019 Debt/Equity Ratios

Year Ended	Total Debt/Total Equity Ratio
2015	1.61
2016	1.65
2017	1.73
2018	1.86
2019	1.90

c) Table B shows the dividends paid by Hydro Ottawa to Hydro Ottawa Holding Inc. ("Holding Company") and from the Holding Company to the City of Ottawa for 2015-2019.[1]

Table B – 2015-2019 Dividend Payments ($000,000s)

Year	Dividend Paid by Hydro Ottawa to Holding Company	Dividend Paid by Holding Company to City of Ottawa
2015	$15.0	$18.2
2016	$17.5	$19.4
2017	$20.6	$20.6
2018	$11.9	$21.9
2019	$18.3	$22.3

[1] The annual dividend paid by Hydro Ottawa to the Holding Company is based on the previous year's results. Accordingly, the dividend based on 2014 results was paid in 2015, and so on. The same applies for the dividend paid by the Holding Company to the City of Ottawa.

INTERROGATORY RESPONSE - EPRF-7

1-EP-7

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A; EB-2015-0004, Exhibit D-1-5 Attachment

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: Comparison of 2014 and 2019 Study Samples

a) Please provide a tabular comparison of the 2014 and 2019 study samples.

b) Please list/highlight/explain the material changes to the sample of US utilities in the current study sample.

c) Please confirm the Hydro One data is for Distribution only.

d) Please provide for the listed Ontario Utilities:
- How many years data are available/used for each (TC and Reliability)?
- What is the OEB/PEG Cohort positioning for each (include historic and latest)?

e) Given over 5 years of Ontario data, why were the specific utilities selected and why was a larger Ontario Sample not used? Please discuss/explain.

RESPONSE:

a) Based upon the wording of the interrogatory, Clearspring is not certain as to what sort of table format is being requested. Nevertheless, Clearspring has provided the information below for the purposes of equipping Energy Probe to develop whatever table it may wish to prepare.

Compared to the 2014 study sample, four utilities were dropped (Dayton Power & Light, Detroit Edison, MDU Resources Group, and Rochester Gas and Electric). Dayton Power & Light was dropped from the sample due to an implausible decline in the number of customers reported (from over 500,000 to 261,210 in 2017). The other three were dropped due to difficulties in gathering the weather variable. Please see the response to interrogatory OEB-12 part (c), where it can be seen that the impact on the results are negligible.

Eight U.S. utilities have had their data investigated and added since the 2014 study (Allete, Duke Energy Kentucky, Kansas Gas and Electric, Northern States Power – WI, PECO Energy, Public Service Electric and Gas, Southwestern Public Service Company, and Toledo Edison). The sample also now includes six additional Ontario distributors (Alectra Utilities, EnWin, Hydro One Networks, Kitchener-Wilmot Hydro, London Hydro, and Toronto Hydro).

b) See the response to part (a) above.

c) Confirmed. The RRR filings for distributors were used as the basis for Hydro One Networks' data.

d) The sample for the six Ontario distributors is 2006-2017 for the total cost benchmarking. The sample for the six Ontario distributors is 2016 and 2017 for the reliability benchmarking, with the exception of Alectra, where it is only for 2017.

In the OEB's latest total cost benchmarking report, Alectra is in Group III (0.3% stretch factor), EnWin is in Group III, Hydro One Networks is in Group IV (0.45% stretch factor), Kitchener-Wilmot Hydro is in Group II (0.15% stretch factor), London Hydro is in Group III, and Toronto Hydro is in Group V (0.6% stretch factor). It is unclear what historic groupings the question is seeking.

e) In Toronto Hydro's recent rate application proceeding,[1] intervenors expressed a desire to have the U.S. and Ontario samples defined consistently. Clearspring decided to base a minimum customer cut-off on the minimum customer count found in the U.S. sample, which was 59,807. To be included in Hydro Ottawa's study, the Ontario distributors needed to be above this threshold and have all available variable data. This assured that the samples would be defined consistently.

[1] Toronto Hydro-Electric System Limited, *2020-2024 Custom Incentive Rate-setting Distribution Rate Application*, EB-2018-0165 (August 15, 2018).

INTERROGATORY RESPONSE - EPRF-8

1-EP-8

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A, Original; EB-2015-0004 Ex D-1-5 Attachment

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: EP wishes to understand better the 2019 Clearspring EA Econometric Model at a similar level of detail and a comparison to that provided in the PSE Ottawa Hydro 2015 Report and Evidence.

a) Please provide the full Clearspring EA Econometric Model specification and formulation in reasonable detail with explanatory notes.

b) Please provide additional information as to how the T-statistic for the Explanatory Variables was calculated and the significance of each of the Statistics.

c) Please provide more information on the Trend, Constant, Coefficients and the calculation of the adjusted R-Squared.

d) Please provide a Comparison Table with the PSE 2015 Model/Report Table 3-1 and the 2019 Model/Report Table 6. List, discuss the rationale for and indicate directionally impact on relative TC score, resulting from each of the changes to the Explanatory Variables, including specifically addition of the Congested Urban and Ontario Binary variables and elimination of Capital Price and Density.

e) Please describe/provide the Hydro Ottawa data set (Section 2.3.3 Other Business Condition Variables) for each of the variables underlying each of the coefficients and projections corresponding to the results presented in Table 6.

f) How did Clearspring EA determine the appropriate Coefficient for each cost variable? Please provide details of the methods.

g) Why is there no Underground Plant variable in the TC model like other models (e.g.Toronto Hydro) and in the Reliability Econometric Model?

h) Why are CU*CU and RD*RD given quadratic functions?

i) Is the structure/formulation of the Clearspring EA Model "standard" and used for other utilities (such as Toronto Hydro and other examples) or "custom" for Ottawa Hydro? Please explain in terms of similarities and differences in the Model specifications and variables to prior models used in Ontario (e.g. Toronto Hydro and Hydro One).

RESPONSE:

a) Please see Section 2.5, Model Estimation Procedure and Specification, in the Clearspring report.

b) The t-statistics are standard outputs of most econometric software packages. Clearspring used STATA, which is a popular software package, to produce the t-statistics and reported STATA's output without modifications. T-statistics measure the confidence level of the significance of the included variable. All included variables are statistically significant at a 99% confidence level (or better).

c) Clearspring provided all the values, standard errors, t-statistics, and p-values on Table 6 of its report. All these values were from STATA's output. The adjusted R-squared value is reported from EViews, which is another popular econometric software package that Clearspring uses.

d) It is not feasible to perform the requested activity within the timeframe allotted for interrogatory responses. It is possible, however, to compare the total impact of the

modeling changes on Hydro Ottawa's score. In the 2014 research, 2013 was the last historical year at the time of the research. Clearspring found that Hydro Ottawa was -29% – that is to say, its costs were 29% below the expected level (benchmark). In this current 2019 research, after making a number of sample, variable, and methodological improvements, Hydro Ottawa's 2013 benchmark score is now -16.9%.

e) Please see the working papers provided by Clearspring that were submitted confidentially by Hydro Ottawa. All the data used in the total cost analysis is compiled and provided in the "Modeling Dataset.xlsx" Excel spreadsheet within the "TC Modeling Dataset" worksheet.

f) Clearspring imported its dataset and used two popular software packages (EViews and STATA) to produce the coefficients. Either program can be used, and both are relatively inexpensive to purchase. Clearspring has provided the EViews model and the STATA model that already has the data loaded and can be run in these packages. Please see Clearpspring's steps on how to replicate the STATA model in the response to interrogatory OEB-29 part (a).

g) Please see the response to interrogatory OEB-17 part (d).

h) Please see the response to interrogatory OEB-17 part (e).

i) Clearspring would consider this a standard model, in the sense that the model could be applied to the larger Ontario distributors to provide an accurate assessment of total costs that account for important items such as serving congested urban areas, rural density, input prices, forestation levels, etc. The model also includes a quadratic term for rural density and congested urban, which allows for the model to be applied to extremely rural or extremely urban utilities, along with utilities with more moderate values such as Hydro Ottawa. The differences are due to sample updates and improvements from one study to another.

INTERROGATORY RESPONSE - EPRF-9

1-EP-9

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A, Original; EB-2015-0004 Ex D-1-5 Attach

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: *Additionally, for future years we can take Hydro Ottawa's cost projections through 2025, allowing us to also benchmark those forecasts "out of sample." We use the model (which is based on historical data) and apply the estimated coefficients and projected independent variable values for Hydro Ottawa to calculate a predicted benchmark value. This predicted benchmark value is then compared to Hydro Ottawa's projected total cost amount.*

a) With reference to the TC projections provided in Table 3-3 and Figure 1-1 of the 2015 Report, please provide a comparison in graphical form to:
   - Actual Total Costs to 2018 and the projection for 2019 and
   - The current historic and projection in Table 1 and Figure 1 in the 2019 Report

b) Comment on the differences and if these relate to:
   - Changes to the Peer group
   - Performance of the peer group (industry TC/productivity)
   - or OH performance/productivity

c) Please discuss in detail why, based on the latest model results, (Table 7) for the period 2019-2025 OH is 7.1% lower in TC relative to the peer group, even though its actual costs are similar to those projected in the 2015 Report for the 2015-2020 IRM period.

d) What is the actual Hydro Ottawa TC score for 2019?

e) Why does the Hydro Ottawa TC score improve 2019-2025?

f) Please provide a discussion regarding what the models indicate regarding trends in industry Total Cost and TFP since 2006 and projections for the next 5 years.

RESPONSE:

a) In the 2014/2015 report, the benchmark score projections for 2018 and 2019 were -15% and -14%, respectively. In the 2019 report, the benchmark score for 2018 is -7.6% and the projected score for 2019 is -4.5%.

b) The larger sample in this new study is an improvement and may have impacted the scores. The model also includes improved variables and specifications relative to the prior Hydro Ottawa study. The productivity of the peer group compared to what it was in 2014 may have also had an impact on the results.

c) Both the 2015 report and this 2019 report had Hydro Ottawa's benchmark scores showing strong cost performance. The utility's total costs are below the benchmark expectations in both reports. Directionally the reports align, with a difference in results due to improved methodology, Hydro Ottawa data changes, and industry changes.

d) Hydro Ottawa's TC benchmarking score in 2019 is -4.5%.

e) The score does improve during the 2019-2025 period – from -4.5% to -8.9% in 2025. This further assumes all the proposed spending levels are approved and spent. Hydro Ottawa's total cost levels are rising at a slower rate than would be expected, given items such as inflation, output growth, and the changes in the explanatory variables. Beyond the high-level answer that Hydro Ottawa's total cost growth during this period is less than what Clearspring's projections expect, Clearspring does not know what the underlying causes of that increased performance are.

f) The model is estimated with data from 2002-2017 for the U.S. sample and 2006-2017 for the Ontario sample (except that Hydro Ottawa data also includes 2018 and projections that run to 2025). If the sample is constrained to the years 2006-2017, the trend variable is near zero. The implications of this are that total costs are not being projected to increase or decrease, except by the other variables in the model and anticipated inflation.

INTERROGATORY RESPONSE - EPRF-10

1-EP-10

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A, Page 33

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: In the 2015 PSE Report Mr. Fenrick concluded:

Question 3: Are the proposed spending levels during the Custom IR period reasonable from a benchmarking perspective and what stretch factor do the proposed spending levels Indicate?

The Hydro Ottawa Custom IR spending projections still indicate a strong total cost performance benchmark outcome. In the 2016 test year, Hydro Ottawa's total cost performance is 18.2% below the benchmark. By 2020, the projections indicate total cost performance will be 13.9% below the benchmark. Hydro Ottawa's Custom IR total cost performance remains statistically superior at the 90% confidence level. ***These results indicate a stretch factor of 0.15% based on the 4th Generation IR stretch factor criteria.***

The corresponding 2019 Report Conclusion is:

Our total cost study findings for Hydro Ottawa show that during the Custom IR period, the Company's total cost benchmarking score is -7.1%. Based on the 4th Generation IR stretch factors, this suggests a stretch factor of 0.30%. The reliability benchmarking results provide no evidence that Hydro Ottawa is producing this better than average cost performance at the expense of reliability outcomes. Therefore, ***Clearspring Energy's recommended stretch factor for Hydro Ottawa's Custom IR application is 0.30%****.*

a) Please confirm that the 2019 study shows Hydro Ottawa total cost is 7.1 %, so the stretch factor indicated is 0.3%.

b) If Hydro Ottawa Total cost was 13.9% below benchmark in 2020 (as per 2015 study) what would be the recommended stretch factor.

c) Hydro Ottawa requested the two additional Scenarios with the large Capital projects removed. Discuss specifically how this change relates to the CEA recommended Stretch Factor(s).

RESPONSE:

a) As discussed in the 2019 Clearspring report, Hydro Ottawa's total costs are 7.1% below the benchmark levels. Based on the OEB's 4th Generation IR framework, this correlates to a 0.3% stretch factor.

b) In this hypothetical, Clearspring would have recommended a 0.15% stretch factor.

c) This request from Hydro Ottawa had no impact on Clearspring's recommended stretch factor.

INTERROGATORY RESPONSE - EPRF-11

1-EP-11

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A; Exhibit 1, Tab 1, Schedule 12, Attachment E, PEG Cost Benchmarking

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: *For the reasons outlined above, Hydro Ottawa respectfully submits that, relative to the PEG model, the study prepared by Clearspring is better-suited to providing an accurate, effective assessment of Hydro Ottawa's efficiency. Clearspring's analysis is therefore an appropriate tool for evaluating the utility's total cost benchmarking performance and assigning the utility a stretch factor in the context of this Application.*

a) Please compare the Clearspring EA Report Input Parameters listed and in particular Ontario Sample, to those in the current PEG Report (when filed). Discuss the differences and indicate the impact on the relative TC score directionally.

b) Please provide a tabulation of the Hydro Ottawa data set (including 2018-2024 projections) and provide sources and explanations for each of the values.

c) For CSI/CDM costs please provide a Table that shows for the sample the amounts eliminated for each and as a percentage of cost.

d) Please explain in detail why PSEs result shows Hydro Ottawa Total Costs are 7.1% below the Clearspring EA Benchmark compared to the referenced PEG Benchmark showing Toronto Hydro Cost Performance is ~21.5 % of the peer group that is above.

e) Please discuss which result (PEG or PSE) should ratepayers and the OEB use in setting the CIR rate plan and the X/stretch factor and list all of the reasons why the Board should adopt the PSE recommendation.

RESPONSE:

a) Clearspring cannot provide a comparison to the PEG Report until after it is filed as evidence in this proceeding.

b) Please see the filed working papers for the Hydro Ottawa data set and the underlying data. Data sources are discussed throughout Clearspring's report.

c) Please see the filed working papers for this information. The spreadsheet entitled "Modeling Dataset.xlsx" and then the "TC Modeling Dataset" worksheet contains the CSI expenses for every observation in column AC, with a variable heading of "ccsi". The total costs are also included in the dataset in column AA, with a variable heading of "ctot".

d) The benchmarking results found in the Clearspring report are more accurate and applicable to Hydro Ottawa than the OEB results. The Clearspring report uses a more comprehensive sample, which includes far more utilities in the range of the Hydro Ottawa. The Clearspring model uses more variables, improves some existing variables, and has better input price adjustments. Additionally, in the OEB benchmarking model as applied to Hydro Ottawa, the model parameters were estimated using data from 2002-2012 and have yet to be updated after the 4th Generation IR proceeding. The Clearspring model results are a far more accurate and up-to-date study of Hydro Ottawa's total costs than the OEB model. This makes the OEB results outdated in regards to application to Hydro Ottawa.

e) Please see the response in part (d) above.

INTERROGATORY RESPONSE - EPRF-12

1-EP-12

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A, Page 28ff, Table 11, Figure 5:

EB-2015-0004, Exhibit D, Tab 1, Schedule 5

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: Clearspring EA States: *We find that Hydro Ottawa's most recent 3-year (2016 to 2018) SAIFI value is 11.3% above the benchmark value. The most recent 3-year CAIDI value is 13.7% below the benchmark value.*

a) Please explain in detail the reasons for the change from SAIFI and SAIDI reliability modelling to SAIFI and CAIDI. Comment specifically relative to OEB System reliability reporting requirements.

b) Please provide the full specification/details of 2019 Clearspring EA Reliability Econometric Model including the Hydro Ottawa input values for variables and the coefficients.

c) Please provide a comparison summary table with the 2015 Model.

d) Please confirm the definition(s) used for CAIDI dataset. Compare to the SAIDI and SAIFI definitions in the 2015 PSE Report.

RESPONSE:

a) This change was not related to the OEB reliability reporting requirements. This was the same change made in the recent Toronto Hydro proceeding.[1] Since SAIDI equals the

[1] Toronto Hydro-Electric System Limited, *2020-2024 Custom Incentive Rate-setting Distribution Rate Application*, EB-2018-0165 (August 15, 2018).

product of SAIFI and CAIDI, Clearspring believed it offered the most information to intervenors if the results were produced for the two components of SAIDI: SAIFI and CAIDI. This allows a separation of utility performance in the frequency of outages (SAIFI) and the average response time when an outage occurs (CAIDI).

b) Please see the response provided to part (a) of interrogatory OEB-15 for the full details of the reliability models. For the data and input values, please see the Clearspring working papers in the “Modeling Dataset.xlsx” spreadsheet and then the “SQ Modeling Dataset” worksheet.

c) Please compare the PSE tables in the 2015 report (Tables 4-2 and 4-3) to the tables in the Clearspring 2019 report (Tables 9 and 10). As discussed in part (a) of this interrogatory, the older report modeled SAIFI and SAIDI, whereas in this report Clearspring modeled SAIFI and CAIDI.

d) Please see the response provided in part (a) above.

INTERROGATORY RESPONSE - EPRF-13

1-EP-13

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment A, Page 28ff , Table 11, Figure 5;

EB-2015-0004, Exhibit D, Tab 1, Schedule 5

SUBJECT AREA: Total Cost and Reliability Benchmarking

Preamble: The 2015 Report indicates

3. The company's SAIFI for their 2012-2014 average is 25.6% above benchmark expectations. This implies Hydro Ottawa customers experience 25.6% more outages versus what the models predict. This result, in conjunction with the total cost result of lowcost performance, is suggestive of an aged infrastructure.

4. The company's SAIDI for their 2012-2014 average is 7.2% above benchmark expectations. This implies Hydro Ottawa customers experience 7.2% more outage minutes versus what the models predict. This is because of the higher than expected SAIFI value discussed in the prior conclusion.

a) With reference to the Reliability (SAIDI/SAIFI) projections provided in Table 4-4 and Figures 4-3 and 4-4 of the 2015 Report please provide a yearly comparison to the current data in the 2019 Report.

b) Please comment on the differences and if/how these relate to the peer group changes or Hydro Ottawa

c) Please provide Reliability projections using the model and Hydro Ottawa data in the current evidence, for the 2018-2024 forecast period. Please explain the approach and methodology in reasonable detail. Specifically indicate how regression of historic data is used to generate the projections.

d) Please provide a discussion if the models show Hydro Ottawa Reliability is/is not improving as shown for each indicator:
   - For the Industry Peer group sample
   - For Hydro Ottawa (given the increase in capital investment).

RESPONSE:

a) The SAIFI results are the only available comparisons. In 2014, the latest year available in the 2015 report, the Hydro Ottawa SAIFI benchmark score was +6.3%. In this 2019 study, the 2014 benchmark score is +1.5%. The other results are similarly directionally aligned, with some differences due to variable and sample changes. These changes include adding Ontario distributors into the reliability dataset.

b) Adding the Ontario distributors into the reliability dataset had an impact on the benchmark scores. Clearspring did not test the models without the Ontario distributors, because Clearspring wanted to include them to be consistent with the total cost benchmarking research.

c) This request cannot be completed. To Clearspring's knowledge, Hydro Ottawa has not produced reliability projections, making it impossible for Clearspring to benchmark them.

d) Please see the response to part (c) above.

INTERROGATORY RESPONSE - EPRF-14

1-EP-14

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment E, PEG Cost Benchmarking

SUBJECT AREA: Total Cost and Reliability Benchmarking

a) What does the right-hand column in Attachment E indicate? Please label/correct.

b) Please provide a tabular and graphical comparison of Hydro Ottawa costs as determined by Clearspring EA to the actual and predicted costs in the referenced PEG exhibit.

c) Please discuss the material differences between the two cost benchmarks.

d) What does the PEG Cost Benchmark suggest for Hydro Ottawa's Stretch factor?

e) Why should the OEB accept the Clearspring EA benchmark rather than the PEG Benchmark? Add to the reasons in the evidence, including if the PEG 4GIRM benchmark is flawed, or out of date.

RESPONSE:

a) The right-hand column on page 8 of Attachment 1-1-12(E) is a copy of the column to its left ("2025 (Test)"), however the Average is rounded. This duplicate column was included by Hydro Ottawa in error and can be disregarded.

b) Please see the response to interrogatory SEC-15 part (a) for a table that compares Hydro Ottawa's actual and benchmark costs found in the Clearspring study.

c) Relative to the OEB's annual benchmarking exercise, Clearspring's results are more applicable to Hydro Ottawa. Clearspring used a more comprehensive sample, which includes far more utilities in the range of Hydro Ottawa. Clearspring's model had more variables, enhanced variables, and better input price adjustments. Additionally, the OEB benchmarking model as applied to Hydro Ottawa had model parameters that were estimated using data from 2002-2012 and that have yet to be updated after the 4th Generation IR proceeding. The Clearspring model results present a far more accurate and up-to-date study of Hydro Ottawa's total costs than the OEB model.

d) The PEG Cost Benchmark suggests a stretch factor of 0.45% for Hydro Ottawa.

e) Please see the response to part (c) above.

INTERROGATORY RESPONSE - EPRF-15

1-EP-15

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment B, UMS Benchmark Study, Table II-1

SUBJECT AREA: UMS Benchmarking Study

a) Please confirm the adjustments for external factors for Hydro Ottawa are minimal i.e. Hydro Ottawa is at the median (Table C-6: Full-Scale Normalization Factors by Domain and Operating Environment).

b) Please explain why Pole Testing unit costs ($43) are in the lower quartile, if lower cost labour was used relative to the 70:30 Labor and Non-Labor Cost Split (Table C-1).

c) Please provide the range of costs and median for the peer group.

d) Please provide details of the Pole Testing calculation, and in particular compare the labour rate to that for other utilities.

e) What recommendation does UMS make to Hydro Ottawa in order to bring Hydro Ottawa Pole Testing costs in line with other utilities?

f) Two programs (Billing-Online and Meter Maintenance) match the Peer Group Median (i.e. straddle second and third quartiles).

- With regard to Billing On-line please explain why the chart shows relative costs in both the 2nd and 3rd quartile please explain why not use ***median*** for where the OH $0.25 cost lies.

- With regard to Meter Maintenance please explain why the chart shows relative costs in both the 2nd and 3rd quartiles please explain why not use ***median*** for where the OH $173 cost lies.

RESPONSE:

a) There were no adjustments made to Hydro Ottawa's unit costs, as normalization involves adjustments to the figures provided by the Peer Group Panel to facilitate a proper comparison to Hydro Ottawa.

b) The fact that Hydro Ottawa is in the bottom quartile in its Pole Test and Inspection program (i.e. higher cost than the vast majority of the Peer Group Panel) reflects costs incurred over a three-year timeframe from 2016 through 2018. As noted beneath Table II-1, Hydro Ottawa started to use more junior (i.e. less expensive) personnel in 2018 – a change that will improve productivity in future years, but not made early enough to appreciably reduce unit cost during the three-year period of this study.

c) Hydro Ottawa is interpreting this question as pertaining to the range of costs and median for the Peer Group Panel in the Pole Test and Inspection program. The normalized unit costs for this specific maintenance program ranged between $14 and $47, with a median value of $25.

If the question is to be interpreted as pertaining to the range of costs and median for the Peer Group Panel across all asset categories and OM&A programs/practices, then Hydro Ottawa would refer EPRF to Appendix G of Attachment 1-1-12(B): Hydro Ottawa Unit Cost Benchmarking Study.

d) The 70/30 labour-non-labour split applied to the Pole Test and Inspection program reflects the apportionment of internal labour, contractor, technology-related, material, and other logistical costs across a wide range of utilities participating in UMS Group-facilitated Global Learning Consortia and various Best Practices Study Groups.

Based on UMS' extensive experience with benchmarking studies, it was the view of UMS that the Peer Group Panel would refuse any request for the specificity inferred from the question, with the likely outcome of fewer respondents. However, in applying the 70/30 split to the costs provided by the Peer Group Panel, UMS was able to achieve the directional accuracy called for in this type of study.[1] That said, acknowledging that labour is the primary component driving cost, the following year-over-year trend in Hydro Ottawa's unit costs for this program should be noted:

Table A – Pole Test and Inspection Program Unit Costs

2016	2017	2018
$51.43	$52.86	$24.34

The reassignment of lower cost labour to this program in 2018 has brought Hydro Ottawa in line with the other utilities in the Peer Group Panel, although the three-year average protocol called for in UMS' methodology masked this improvement.

e) As noted in the response to part (d) above, the reassignment of lower cost labour in 2018 has already improved Hydro Ottawa's situation with respect to unit costs for Pole Test and Inspection.

f) The observation being made is correct, in that Hydro Ottawa's unit costs for Billing-Online and Meter Maintenance reside at the exact median of the Peer Group Panel ($0.25 and $173, respectively). UMS Group opted to illustrate that position by showing a straddling between the second and third quartiles.

[1] As explained in the UMS study, "directional accuracy rather than precision is the acceptable standard in conducting such comparisons." *See* Attachment 1-1-12(B): Hydro Ottawa Unit Costs Benchmarking Study, page 15.

INTERROGATORY RESPONSE - EPRF-16

1-EP-16

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment C, Table 1; Exhibit 1, Tab 1, Schedule 12, Attachment D

SUBJECT AREA: Electricity Utility Scorecard

Preamble:

Note that a downward trend indicates performance improvement for the following four measures: Number of General Public Safety Incidents, Rate per 1000 km of line, Average Number of Hours that Power to a Customer is Interrupted, and Average Number of Times that Power to a Customer is Interrupted.

a) Please provide the Hydro Ottawa SAIDI and SAIFI Data for the past 10 years (up to 2019) in tabular and graphical format.

b) Please provide the targets for 2020-2025.

c) Why has reliability not improved during the prior CIR Plan? Please discuss.

d) Please provide the 2015 and 2018 Cause Code charts. Compare and discuss main changes to Attachment D, Figures 8 and 9.

RESPONSE:

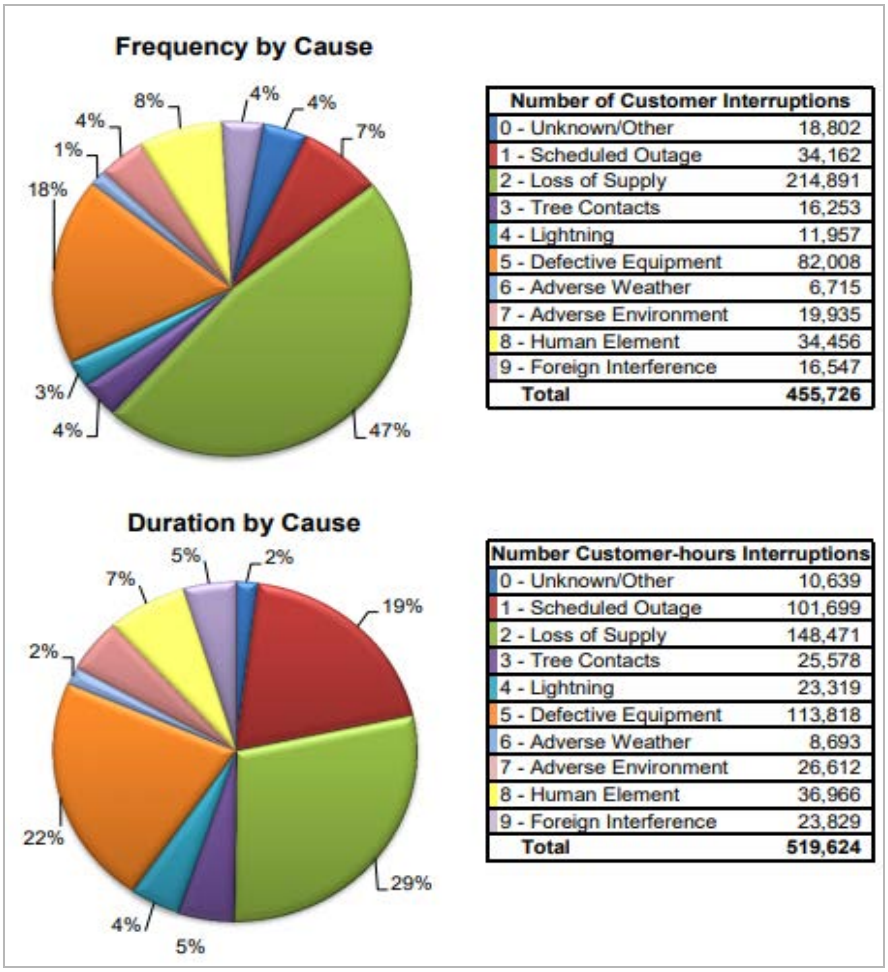
a) Please see Attachment EPRF-16(A): 10-Year SAIFI and SAIDI data.

b) Hydro Ottawa's targets for SAIDI and SAIFI excluding Loss of Supply and Major Event Days for 2020 are 0.96 and 0.74, respectively. Targets are calculated every year based on the previous five-year average annual result, excluding Loss of Supply and Major Event Days. Targets for 2021-2025 will be calculated as such data becomes available. Also, please note that reliability targets as presented on the Electricity Utility Scorecard are calculated by the OEB. Hydro Ottawa is not proposing to change its reliability targets for Electricity Utility Scorecard purposes.

c) Hydro Ottawa's focus on reducing the duration of outages has resulted in a significant improvement in SAIDI over the prior Custom IR Plan. The utility continues to address an increasing trend in outages caused by Adverse Weather, Foreign Interference, and Loss of Supply.

d) Please see Attachment 1-1-12(D): Ontario Energy Board Electricity Distributor Yearbook and Performance Dashboard, Figures 8 and 9, for the 2018 Cause Code chart. Please see Figure A below for Hydro Ottawa's 2015 Cause Code charts obtained from the 2015 Yearbook of Electricity Distributors released by the OEB.

Figure A – 2015 Hydro Ottawa Cause Codes



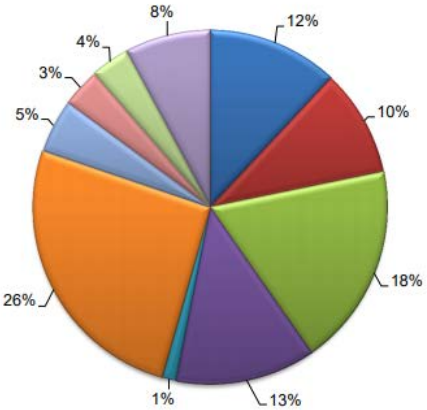
Number of Customer Interruptions	
0 - Unknown/Other	18,802
1 - Scheduled Outage	34,162
2 - Loss of Supply	214,891
3 - Tree Contacts	16,253
4 - Lightning	11,957
5 - Defective Equipment	82,008
6 - Adverse Weather	6,715
7 - Adverse Environment	19,935
8 - Human Element	34,456
9 - Foreign Interference	16,547
Total	**455,726**

Number Customer-hours Interruptions	
0 - Unknown/Other	10,639
1 - Scheduled Outage	101,699
2 - Loss of Supply	148,471
3 - Tree Contacts	25,578
4 - Lightning	23,319
5 - Defective Equipment	113,818
6 - Adverse Weather	8,693
7 - Adverse Environment	26,612
8 - Human Element	36,966
9 - Foreign Interference	23,829
Total	**519,624**

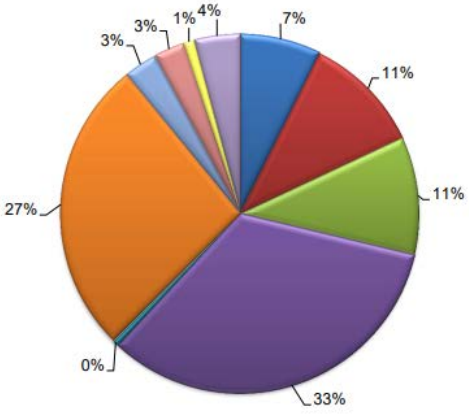
For Hydro Ottawa, outages caused by Loss of Supply were the most impactful to SAIFI and SAIDI in both 2015 and 2018. Outages caused by Adverse Weather significantly affected the duration of outages in 2018 compared to 2015 SAIDI. Outages caused by Defective Equipment decreased by almost 50% in 2018 compared to 2015 SAIFI.

Please see Figure B below for the provincial Cause Code charts from 2015, which were also obtained from the 2015 OEB Yearbook of Electricity Distributors.

Figure B – 2015 Provincial Cause Codes



Number of Customer Interruptions	
0 - Unknown/Other	1,307,494
1 - Scheduled Outage	1,073,383
2 - Loss of Supply	2,025,040
3 - Tree Contacts	1,392,898
4 - Lightning	143,816
5 - Defective Equipment	2,818,929
6 - Adverse Weather	537,814
7 - Adverse Environment	385,906
8 - Human Element	389,331
9 - Foreign Interference	851,603
Total	**10,926,214**



Number of Customer-hours of Interruptions	
0 - Unknown/Other	1,723,966
1 - Scheduled Outage	2,546,762
2 - Loss of Supply	2,499,780
3 - Tree Contacts	7,837,329
4 - Lightning	124,840
5 - Defective Equipment	6,289,278
6 - Adverse Weather	705,316
7 - Adverse Environment	657,278
8 - Human Element	233,935
9 - Foreign Interference	965,080
Total	**23,583,564**

At the provincial level, the following changes are observed:

- The most impactful cause code for SAIFI was Defective Equipment, in both 2015 and 2018.
- Tree contacts are the most impactful cause code for SAIDI in both 2015 and 2018.

INTERROGATORY RESPONSE - EPRF-17

1-EP-17

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment C

SUBJECT AREA: Electricity Utility Scorecard

a) Please provide Figure 2 page 7 with the Hydro Ottawa data from Table 4 included, then update for 2018 and 2019.

b) Please update Figures 14 and 16 for 2018 and 2019 for provincial averages if possible, if not then for Hydro Ottawa.

RESPONSE:

a) As the Percentage of New Residential and Small Business Connections Completed on Time and the Percentage of Appointments Met on Time are two separate measures, they cannot be combined into a single figure.

Please find in Figures A and B below an updated figure for each measure, inclusive of Hydro Ottawa's 2019 results.[1] Note that, at this time, the 2019 Yearbook of Electricity Distributors has not yet been published by the OEB. The peer group results and the provincial averages for 2019 are therefore not included.

[1] Hydro Ottawa has revised Figure 2, as per this interrogatory request. To confirm, these revisions should not be interpreted as replacing Figure 2 in Hydro Ottawa's original Application.

Figure A – Peer Group and Provincial Averages vs. Hydro Ottawa Results: Percentage of New Residential and Small Business Connections Completed on Time *(Industry Target: 90%)*

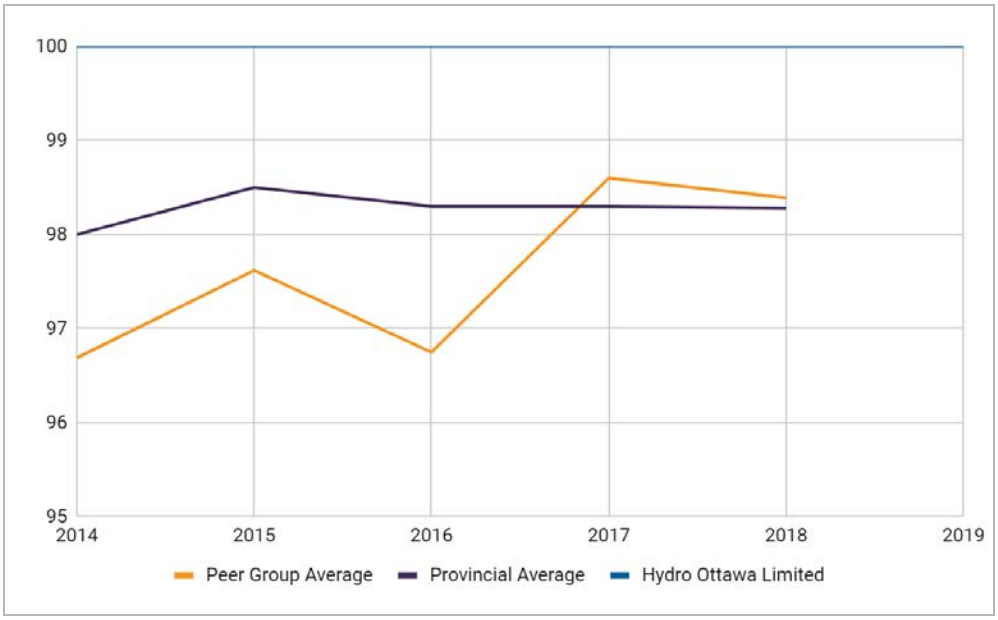
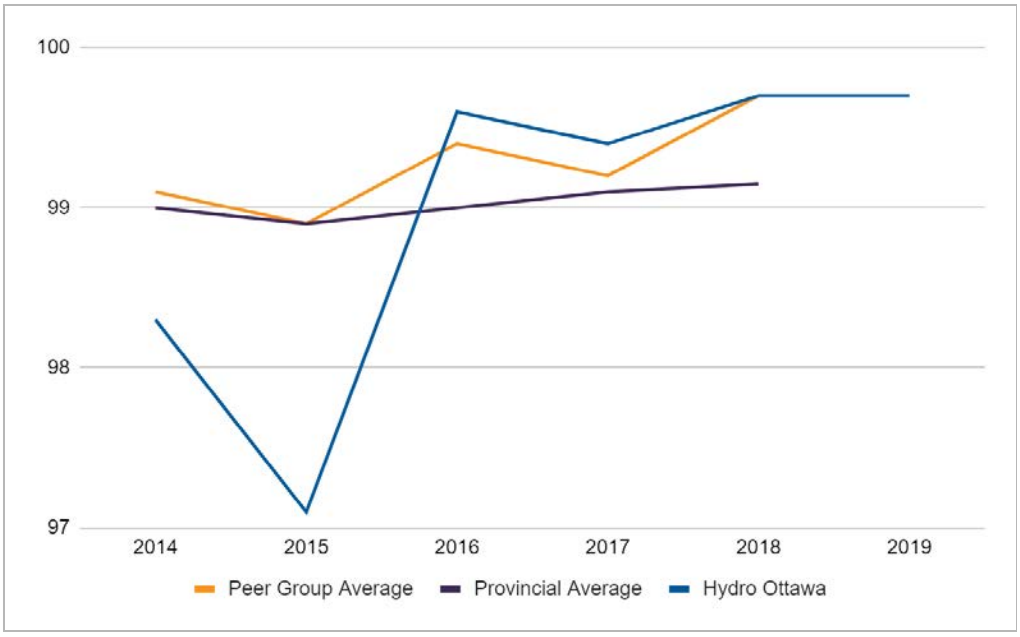
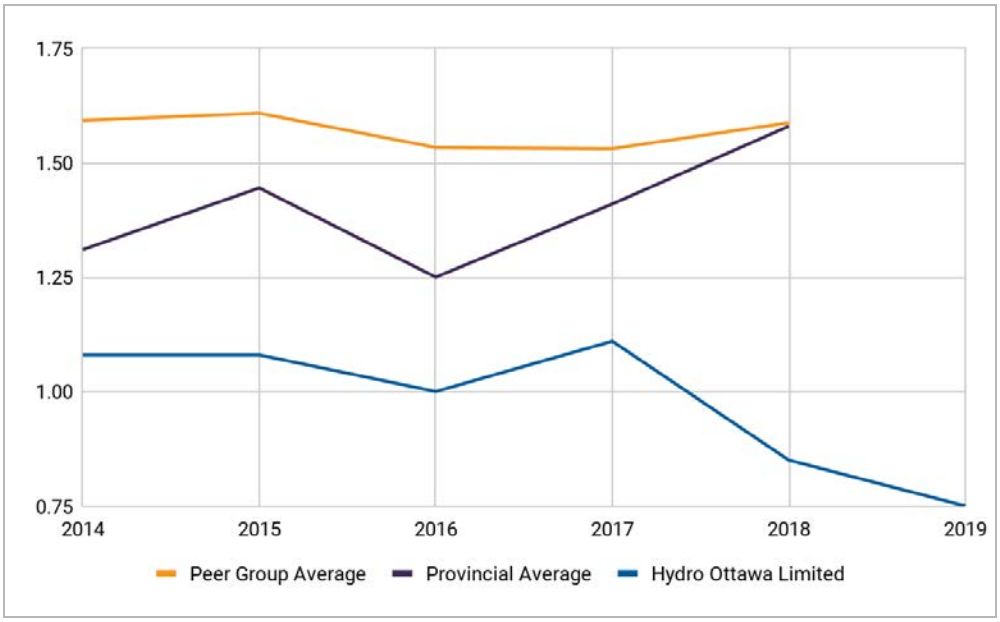


Figure B – Peer Group and Provincial Averages vs. Hydro Ottawa Results: Percentage of Scheduled Appointments Met on Time *(Industry Target: 90%)*



b) As noted above, the 2019 Yearbook of Electricity Distributors has not yet been published. The peer group and provincial information therefore cannot be updated for 2019. Please see Figures C and D below for updated figures, inclusive of Hydro Ottawa's 2019 SAIDI and SAIFI measures.[2]

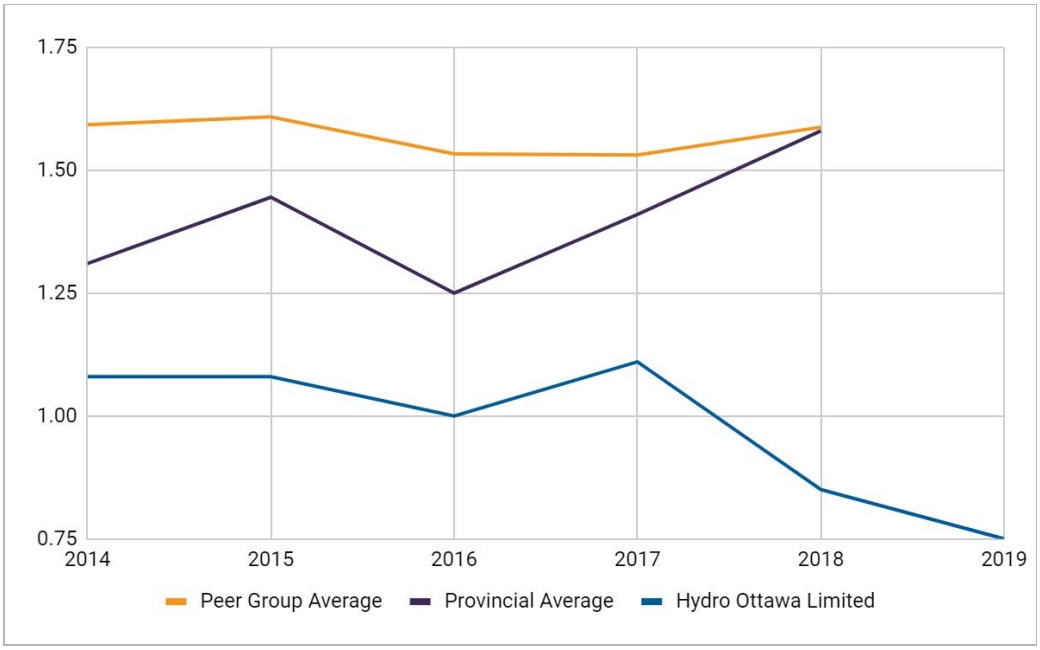
Figure C – Peer Group and Provincial Averages vs. Hydro Ottawa Results: Average Number of Hours that Power to a Customer is Interrupted



[2] Hydro Ottawa has revised Figures 14 and 16, as per this interrogatory request. To confirm, these revisions should not be interpreted as replacing Figures 14 and 16 in Hydro Ottawa's original Application.

1 **Figure D – Peer Group and Provincial Averages vs. Hydro Ottawa Results: Average**
2 **Number of Times that Power to a Customer is Interrupted**

3



INTERROGATORY RESPONSE - EPRF-18

1-EP-18

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment C, Figures 19 and 20

SUBJECT AREA: Electricity Utility Scorecard

a) Please update Figure 19 for 2019 for peer group if possible, if not for Hydro Ottawa.

b) Please update Figure 20 for 2019 for peer group if possible, if not for Hydro Ottawa.

RESPONSE:

a) The Pacific Economics Group ("PEG") Benchmarking Update Calculations and stretch factor assignments for 2019 are not available as of yet. These are anticipated to be available in August 2020. Hydro Ottawa is therefore unable to update Efficiency Assessments as presented in Figure 19 for the peer group, nor for itself, for 2019. However, it should be noted that based on the PEG Benchmarking Forecast model as presented on page 8 of Attachment 1-1-12(E): PEG Benchmarking Forecast, Hydro Ottawa anticipates that the utility will remain in Cohort IV for 2019.

b) Similar to the response provided in (a) above, without the updated PEG Benchmarking Update Calculations for 2019, Hydro Ottawa is unable to update Total Cost per Customer as presented in Figure 20 (and derived from PEG) for the peer group, nor for itself.

INTERROGATORY RESPONSE - EPRF-19

1-EP-19

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment F, Gartner Report, page 11

SUBJECT AREA: Benchmarking

Preamble:

Hydro Ottawa has a lower ratio of IT full time equivalent staff (FTEs) as a percentage of company employees compared to the peer group average at 8.4% versus 10.1%.
– Hydro Ottawa reported a higher allocation to outsourcing and managed services compared to the peer group average. The benchmark does not convert managed services contracts to an adjusted IT FTE. As a result, organizations using more managed services than a peer group using more in-house or staff augmentation will have a lower IT FTE per company employee ratio.

a) Please explain in more detail how this finding affects Hydro Ottawa Ranking/score to the peer group.

b) Do outsourced Contractors use their own IT resources?

c) Specifically provide/compare the IT costs per user (including in-house contractors) and per employee.

d) Please confirm the Gartner Benchmark year is 2018.

e) Please provide the Hydro Ottawa IT costs for 2015-2020 in the 4 categories of Gartner benchmarking chart of accounts. Provide historic and test forecast to actuals Capital and O&M as reported in the OH evidence.

f) Please provide the Hydro Ottawa IT Cost projections for 2021-2025 in both the Gartner benchmarking chart of accounts format and as Capital, O&M and FTEs.

RESPONSE:

a) Please see page 19 of Attachment 1-1-12(F): Hydro Ottawa IT Budget Assessment Benchmark, which shows the utility allocated 4% more of its IT spend to outsourcing than the Peer Group average (31% versus 27%). Organizations that are less reliant on outsourcing typically see higher spending allocations towards personnel, hardware, and/or software. In the case of personnel, Hydro Ottawa's IT Full Time Equivalents ("FTEs") as a percentage of total company employees was 16% less than the Peer Group average (8.4% versus 10.1%). When looking at these two metrics together, the finding is consistent with what Gartner would expect to see.

b) Outsourced contractors may use their own IT resources to achieve their contractual mandate. Additionally, outsourced contractors may work closely with Hydro Ottawa IT resources, as required.

c) The IT costs per user/employee is derived from Hydro Ottawa's total IT Budget, as defined on page 6 of Attachment 1-1-12(F): Hydro Ottawa IT Budget Assessment Benchmark, distributed over the utility's 12-month average FTE headcount. Please see page 25 of the benchmarking study, which indicates that 5% of contractors as compared to 95% of in-house would be considered in-house contractors in IT (approximately 2.75 FTE). If Hydro Ottawa included IT in-house contractors within the headcount data, this would reduce the cost per user by approximately 0.4%.

d) Hydro Ottawa confirms that the IT Budget Assessment Benchmark study was conducted for the year 2018.

e) Please see the response to part (f) of interrogatory SEC-23.

f) Please see the response to part (f) of interrogatory SEC-23.

INTERROGATORY RESPONSE - EPRF-20

1-EP-20

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment G, Mercer Benchmark

SUBJECT AREA: Compensation

Please file the previous Hydro Ottawa Mercer Compensation Benchmark Report filed with the Board (reference case and Exhibit number).

RESPONSE:

There was no previous Hydro Ottawa Mercer Compensation Benchmark Report filed with the OEB. Please see Attachment 1-1-12(G): Compensation Benchmarking Study for a copy of the Mercer Compensation Benchmark Report that was prepared in support of this Application.

INTERROGATORY RESPONSE - EPRF-21

1-EP-21

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment G, Mercer Benchmark Page 3

SUBJECT AREA: Compensation

Preamble:

MEARIE survey data is effective 2016, 2017, 2018 and 2019 and has been aged by a total of 8.00%, 5.06%, 2.8% and 0% respectively to reflect the annual median salary increases since 2017 (as reported in Mercer's *Compensation Planning Surveys).*

a) Please list positions that are based on MEARIE data.

b) Please provide the Mercer Compensation Planning Results for 2016-2019 corresponding to the aging percentages.

c) Why are the indicated aging percentages materially above inflation in 2016-2018?

RESPONSE:

a) The following positions are compared only to the MEARIE data source:

- Manager, Distribution Operations;
- Supervisor, Distribution Operations; and
- System Operator.

b) The Mercer Compensation Planning Study Reports are attached as follows:

- Attachment EPRF-21(A): 2017-2018 Compensation Planning Study
- Attachment EPRF-21(B): 2018-2019 Compensation Planning Study
- Attachment EPRF-21(C): 2019-2020 Compensation Planning Study

c) Mercer's aging methodology begins with the merit increase budgets, which can be found in each of the attachments noted in part (b) above at page 4. Thereafter, the methodology takes into consideration more detailed, proprietary survey data, such as promotional increase budgets to reflect the annual median salary increases (details of which are not made public).

INTERROGATORY RESPONSE - EPRF-22

1-EP-22

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 12, Attachment G, Mercer Benchmark Comparison, Pages 6-7

SUBJECT AREA: Compensation

a) Please indicate why MEARIE Positions have no data under Total Cash Compensation?

b) Please explain if this deficiency may result in some positions having greater Total Compensation than the peer group.

c) Please list all positions with a Total Cash Compensation 10% greater than P50. Separate into front and back office positions.

d) Please discuss the reasons why each of these positions are compensated above P50+10%

RESPONSE:

a) There is no data under Total Cash Compensation for certain MEARIE benchmark positions, as there was insufficient market data available.

b) This is not a deficiency. Please see the response in part (d) below.

c) The following positions, with one exception (Communications Advisor), have a Total Cash Compensation greater than 10% of P50 in one data source only, as indicated below:

- Communications Advisor – Front Office – Mercer Benchmark Database[1]
- Supervisor, Billing and Supervisor, Collections – Front Office – Mercer Benchmark Database only
- Warehouse Attendant – Back Office – Mercer Benchmark Database only
- IT Service Desk Technician – Back Office – Mercer Benchmark Database only
- CAD/GIS Technician – Back Office – MEARIE only
- Customer Contact Agent – Front Office – Mercer Benchmark Database only
- Billing Services Associate – Front Office – Mercer Benchmark Database only

d) All of the positions noted in part (c) above, with the lone exception identified in the foregoing footnote, have a Total Cash Compensation greater than 10% of P50 in one data source only, while in the other data source, the Total Cash Compensation is within +/-10% or below -10% of P50. As described in Footnote 1 in part (c) above, for the one exception (Communications Advisor), there is only one data source and the average salary is slightly lower than Total Cash Compensation at P75.

[1] This position is an exception, as there is only one data source available for benchmarking purposes and the average salary is slightly lower than Total Cash Compensation at P75.

INTERROGATORY RESPONSE - EPRF-23

1-EP-23

EXHIBIT REFERENCE:

No Reference

SUBJECT AREA: Compensation

a) Does Hydro Ottawa have a Total Compensation benchmark comparison for Senior Executive positions?

b) If so please file this. If not, please explain how ratepayers can be satisfied that Hydro Ottawa Executive Compensation is reasonable.

RESPONSE:

a) Please see the response to part (d) of interrogatory OEB-49.

b) Please see the response to part (d) of interrogatory OEB-49.

INTERROGATORY RESPONSE - EPRF-24

1-EP-24

EXHIBIT REFERENCE:

Exhibit 1, Tab 1, Schedule 13, page 4; Exhibit 4 -1-1.

SUBJECT AREA: Custom Incentive Rate-Setting Framework

Preamble:

Custom IR Framework The Custom Price Escalation Factor utilized in this Application will embed productivity savings for customers by capping any increases to operational funding. The productivity escalator that has been applied to OM&A expenditure levels for 2022-2025 is 2.51%. As a result, OM&A spending was reduced by approximately $ 13.1 million over the term of the Custom IR rate plan. (For more details on projected O M&A expenditures for the upcoming five-year rate term, please see Exhibit 4 -1-1: Operations, Maintenance and Administration Summary).

a) Please provide a Table with more details of the $13.1 million in productivity savings.

b) Please reconcile to the $13.1 million.

c) Please confirm the OM&A escalator includes a growth factor. Provide more information how this applied.

RESPONSE:

a) Table A below outlines how OM&A spending levels for 2021-2025, as established through the use of the custom escalator and as proposed in the Application, differ from those that were originally contemplated under the initial draft of Hydro Ottawa's five-year business plan.

Table A – OM&A Expenditures - Draft Business Plan vs. Final Application ($'000,000s)[1]

Year	2021	2022	2023	2024	2025	Total
Original Business Plan	$93.9	$97.9	$101.3	$105.4	$108.2	$506.7
Submitted Levels[2]	$93.9	$96.3	$98.7	$101.2	$103.7	$493.8
Difference	**$0.0**	**$1.6**	**$2.7**	**$4.3**	**$4.5**	**$13.1**

The $13.1M in savings will be accomplished through the productivity and continuous improvement initiatives that are summarized in Exhibit 1-1-13: Productivity and Continuous Improvements and detailed throughout the Application. Additional information is likewise available in the responses to interrogatories OEB-47 and CCC-29.

b) Please see the response to part (a) above.

c) The escalation factor of 2.51% includes a growth factor of 0.4%. The derivation of this value is detailed on pages 20-24 of UPDATED Exhibit 1-1-10: Alignment with the Renewed Regulatory Framework.

[1] Totals may not sum due to rounding.
[2] 2021-2025 Business Plan OM&A levels have been escalated by 2.51%.

INTERROGATORY RESPONSE - EPRF-25

1-EP-25

EXHIBIT REFERENCE:

Exhibit 1, Tab 2, Schedule 1, Attachment C, Customer Satisfaction Survey

SUBJECT AREA: Customer Satisfaction

Preamble: 54% of Hydro Ottawa customers indicated they had experienced a Power Outage compared to 49% national and 44% Ontario.

a) Please indicate the background information provided to respondents.

b) Please indicate if the 2018 MEDs were discussed and therefore this is why the high response occurred.

c) Please comment on the difference to the response to the question on reliability (page 16-92%).

RESPONSE:

a) Background information was not discussed in advance of the question being posed. The script read, “In the past 12 months have you experienced any problems with Hydro Ottawa with power failures or outages?”

b) The survey was conducted between September 17 and October 10, 2018. Major Event Days (“MEDs”) that occurred in 2018 were not discussed.

It is important to note, however, that on September 21, 2018, a devastating storm that resulted in the formation of six tornados, heavy winds, and lightning across Ottawa and the surrounding region left approximately one-third of the City of Ottawa without power. At the peak of the aftermath, 171,462 Hydro Ottawa customers (approximately one-half of the total customer base) were without power.

Due to the timing of the survey, it would reasonably be expected that more customers would have responded affirmatively to having recently experienced an outage.

c) The question asked in the survey was the following:

The following items relate to the operations side of Hydro Ottawa.

Would you tell me if you agree or disagree with each statement.
"Hydro Ottawa has a standard of reliability delivering electricity that meets your expectations". Is that agree/disagree strongly or somewhat?
4 Agree strongly
3 Agree somewhat
2 Disagree somewhat
1 Disagree strongly
0 NEITHER
? DON'T KNOW

The fact that Hydro Ottawa scored four points higher than its national and provincial peers may be the result of the utility's performance in response to the storm that occurred on September 21, 2018.

The storm included wind speeds that exceeded 265 km/h and resulted in the need to replace 80 hydro poles and 15 transformers.

Within 72 hours of the tornados touching down and causing damage, all primary lines had been rebuilt with 95% of affected customers restored. Service to all remaining customers was subsequently restored over the next 48 hours.

INTERROGATORY RESPONSE - EPRF-26

1-EP-26

EXHIBIT REFERENCE:

Exhibit 1, Tab 2, Schedule 1, Attachment E, Innovative Reliability & Power Quality

SUBJECT AREA: Customer Satisfaction

a) Please provide the comparable results from 2015 for the two questions.

- In the past 12 months, how many power outages do you recall experiencing at home?
  [asked of all respondents, Hydro Ottawa; n=450]

- Please indicate how satisfied you are with the way that Hydro Ottawa is performing on each of the following attributes related to your electrical service. Please use the scale from 0 to 10, where 0 means very dissatisfied and 10 means very satisfied.
  [asked of all respondents who experienced outages, Hydro Ottawa; n=390]

b) Please comment on possible reasons for the differences e.g. recollection higher/lower, decrease in reliability, recent major event days

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RESPONSE:

a) There are no comparable results for 2015, as Hydro Ottawa did not purchase a copy of the National Electricity Customer Satisfaction Report produced for that year. The utility thus does not have access to the requested data for 2015.

b) The survey was conducted between October 4 and 29, 2018. Major Event Days ("MEDs") that occurred in 2018 were not discussed.

It is important to note, however, that on September 21, 2018, a devastating storm that resulted in the formation of six tornados, heavy winds, and lightning across Ottawa and the surrounding region left approximately one-third of the City of Ottawa without power. At the peak of the aftermath, 171,462 Hydro Ottawa customers (approximately one-half of the total customer base) were without power.

Due to the timing of the survey, it would be expected that more customers would have responded affirmatively to having recently experienced an outage.

INTERROGATORY RESPONSE - EPRF-27

1-EP-27

EXHIBIT REFERENCE:

Exhibit 1, Tab 2, Schedule 1, Attachment E, Innovative Reliability & Power Quality pages 75 and 76

SUBJECT AREA: Customer Satisfaction

a) Were the respondents given any information or examples of technology prior to the question?

b) Please discuss why technology to improve reliability ranks first, when respondents indicated reliability is satisfactory in earlier questions.

RESPONSE:

a) Customers were provided the following preamble prior to the question referenced in the survey:

> *"Sometimes new technology can save money in electricity systems. Other times it can add costs. Now we would like to ask you about some ways that electricity companies can improve services to you that would add some costs to your bills. Please indicate how willing you would be to pay more for the following technological innovations from Hydro Ottawa."*[1]

Respondents were not provided with specific examples of technology.

b) New technology that would reduce the number or length of outages was the third-ranked priority when it comes to developing new technology. Technology to reduce the number or length of outages ranked behind "testing new technology that may save you money

[1] Attachment 1-2-1(E): 2018 National Electricity Customer Satisfaction Report, page 73.

but that still needs to be thoroughly tested" and "New technology to reduce the environmental impact of the provincial electricity grid." Please refer to page 74 of Attachment 1-2-1(E): 2018 National Electricity Customer Satisfaction Report for further details.

INTERROGATORY RESPONSE - EPRF-28

1-EP-28

EXHIBIT REFERENCE:

Exhibit 1, Tab 2, Schedule 2, Attachment A, Innovative Phase II, Pages 5-7;

Exhibit 1, Tab 2, Schedule 2, Attachment A, Page 27, 1.6 Appendices

SUBJECT AREA: Customer Engagement

a) Please clarify and provide a copy of the information provided to respondents on the OH Distribution System Plan.

b) Prior to responding to the Pacing of Investment questions were respondents given information on the underground and overhead parts of the distribution plant? If so provide this information (such as that in second reference).

c) If not discuss how respondents distinguished underground and overhead assets and accelerated investment in each.

d) How was “serving a growing city” defined for respondents? Please expand on definition provided to respondents.

e) Discuss why respondents are split on reliability investments e.g. not understanding question or couldn’t decide between options, etc.

RESPONSE:

a) Please refer to pages 374-378 of Attachment 1-2-2(A): Innovative Research Group - Customer Engagement Report on Hydro Ottawa's 2021-2025 Rate Application.

b) Please refer to page 374 of Attachment 1-2-2(A): Innovative Research Group - Customer Engagement Report on Hydro Ottawa's 2021-2025 Rate Application.

c) Please see the response to part (b) above.

d) Please refer to page 383 of Attachment 1-2-2(A): Innovative Research Group - Customer Engagement Report on Hydro Ottawa's 2021-2025 Rate Application.

e) With regards to reliability investments, customers are evenly split between an accelerated approach and the draft plan, at 44% and 39%, respectively.

INTERROGATORY RESPONSE - EPRF-29

1-EP-29

EXHIBIT REFERENCE:

Exhibit 1, Tab 3, Schedule 1, Attachment A, Financial Statements

SUBJECT AREA: Financial Performance

Please provide the 2018 audited and 2019 unaudited Financial Statements

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RESPONSE:

See Attachment 1-3-1(B): 2018 Audited Financial Statements for the 2018 Audited Financial Statements, filed on February 10, 2020.

See Attachment 1-3-1(C): 2019 Audited Financial Statements for the 2019 Audited Financial Statements, filed on May 5, 2020.

INTERROGATORY RESPONSE - EPRF-30

2-EP-1

EXHIBIT REFERENCE:

Exhibit 2, Tab 1, Sch. 1, page 12

SUBJECT AREA: Rate Base

a) Please provide detailed explanations for the $60.6 variance caused by the expenditures in the construction of the three substation projects. For each project please file a table that shows the approved estimates and the actual expenditures showing amounts for materials, labour, overheads, and interest during construction with variance explanations for each amount.

b) Does Hydro Ottawa expect the OEB to conduct a prudence review of the $60.6 million variance? If the answer is no, please explain why not.

RESPONSE:

a) The $60.6M variance stated in Exhibit 2-1-1: Rate Base Overview, Table 5 (as originally submitted) represents the accumulated variance in Average Net Fixed Assets from the 2016-2018 historical years and the 2019 bridge year. Accounting for 2019 actuals, this variance increased to $66.6M. While the year-over-year variance is largely due to the timing of the three substation projects' capitalization dates versus the forecast in-service dates, the total variance on these three projects is not significant, as demonstrated in Table B below.

Table A below categorizes the cumulative $66.6M variance into the key areas once year-over-year timing differences have been removed.

Table A – Explanation of Cumulative $66.6M Variance ($'000,000s)

Variance Explanation	($)
Increased System Access due to the level of third-party demand exceeding projections, including the City of Ottawa's Light Rail Transit Project, the Canada Science and Technology Museum, Elgin Street Renewal, and construction of an Amazon distribution warehouse. All of these projects were third-party driven, therefore Hydro Ottawa had an obligation to complete.	$31.0
Increased Emergency and Critical Renewal largely explained by multiple extreme weather events during the 2016-2019 timeframe, especially in 2018 which featured an ice storm in April, a wind storm in May, and six tornadoes in September. All of these events resulted in the utility incurring a large amount of unbudgeted capital replacement costs. Increased critical renewals was because of increased asset inspections as part of its reliability improvement program.	$31.2
Smaller variances in other projects offsetting each other	$(7.5)
Average Accumulated Depreciation	$11.9
TOTAL	**$66.6**

Table B below compares the actual-to-budget variance of the three station projects. The combined budgets for the three projects was $41.9M, with actual spending totalling $42.0M. The only significant overage occurred in relation to the Overbrook station project, as explained below.

Table B – Actual-to-Budget Variance for Merivale, Richmond South & Overbrook Stations Projects ($'000,000s)

Category	Budget	Actual	Forecasted In-Service	Actual In-Service	Variance Explanation
Merivale DS					
Interest	$1.22	$1.14			Delays in construction of the Merivale project due to required HONI changes in the final design. The items identified in the HONI feasibility study failed to capture HONI's concern and a large change in scope was required after final review of the design drawings.
Labour	$8.19	$7.66			
Materials	$6.77	$6.33			
Overheads	$0.94	$0.88			
TOTAL	**$17.13**	**$16.01**	**2018**	**2019**	
Richmond South DS					
Interest	$0.55	$0.41			Delays in construction of Richmond South due to project scope changes and delays in review of SIA/CIA by the IESO. Scope was reduced due to cancellation of TransCanada's Energy East pipeline.
Labour	$10.49	$7.85			
Materials	$5.57	$4.17			
Overheads	$1.05	$0.79			
TOTAL	**$17.66**	**$13.22**	**2018-2019**	**2019**	
Overbrook					
Interest	$0.23	$0.41			Scope change at Overbrook station, original scope involved replacement of 13kV switchgear. During detailed estimate review, it was determined that the 4kV also needed to be replaced and that it should be done before the 13kV to facilitate staging of the project. The 4kV replacement has been complete and 13kV replacement started in 2019 under a separate project.
Labour	$3.51	$6.31			
Materials	$2.96	$5.32			
Overheads	$0.43	$0.76			
TOTAL	**$7.13**	**$12.80**	**2017-2018**	**2019**	

b) As part of this proceeding, Hydro Ottawa expects that a prudency review of the $66.6M overspending of Hydro Ottawa's 2016-2019 planned expenditures will take place. As noted above, the $66.6M variance was in large part attributable to uncontrollable items such as third-party driven demand work and extreme weather.

INTERROGATORY RESPONSE - EPRF-31

2-EP-2

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Table 8.30, page 329, and page 332; Exhibit 2, Tab 4, Sch. 3, Att. F, Pages 6 and 7

SUBJECT AREA: Rate Base

a) Please provide a list of Fleet vehicles purchased each year from 2016 to 2020.

b) Please provide the number of Fleet vehicles in service at the start of 2016 and at the year end of each year from 2016 to 2020.

c) Please provide a detail explanation of Fleet variances for each year from 2016 to 2020 shown in Exhibit 2, Tab 4, Sch. 3, page 329, Table 8.30.

d) Does Hydro Ottawa own all its Fleet vehicles? If the answer is yes, has Hydro Ottawa considered leasing some or all of its vehicles. If the answer is no, what proportion of Fleet vehicles are leased?

RESPONSE:

a) Please see Table A below for the list of vehicles purchased. The years 2016-2019 are based on actuals, while 2020 is based on projection.

1 **Table A – List of Vehicles Purchased from 2016-2020**

Year Purchased	Unit Number	Vehicle Category	Description
2016	1608	Heavy Duty	Walk Thru Body(CV)Freightliner Chassis (Enbridge Style)
2016	1606	Heavy Duty	Walk Thru Body(CV)Freightliner Chassis (Enbridge Style)
2016	1602	Heavy Duty	Self operating underground cable pulling trailer
2016	1601	Heavy Duty	Underground Cable Pulling truck
2016	1514	Heavy Duty	41’ Single bucket material handler
2016	1513	Heavy Duty	68’ Double bucket truck with elevator
2016	1512	Heavy Duty	68’ Double bucket truck with elevator
2016	1511	Heavy Duty	60’ Double bucket truck
2016	1510	Heavy Duty	60’ Double bucket truck
2016	1509	Heavy Duty	60’ Double bucket truck
2016	1508	Heavy Duty	47’ Single bucket non material handler
2016	1507	Heavy Duty	41’ Single bucket with material handler
2016	1605	Light Duty	Ford F-150 extended cab 2wd Pickup Truck
2016	1604	Light Duty	Chevrolet 1500 Silverado extended cab 2wd Pickup Truck
2016	1603	Med Duty	Ford Transit Cube van12 Foot Cube van
2016	1607	Other	Flat deck trailer
2017	1720	Heavy Duty	58' Single bucket track machine back yard unit
2017	1706	Heavy Duty	46’ Single bucket truck material handler
2017	1698	Heavy Duty	Altec 37’ Track Digger for backyards
2017	1718	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1717	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1716	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1715	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1714	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck

Year Purchased	Unit Number	Vehicle Category	Description
2017	1713	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1712	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1711	Light Duty	Dodge 1500 extended cab 2wd Pickup Truck
2017	1710	Light Duty	Chevrolet 2500 extended cab 4wd Pickup Truck
2017	1709	Light Duty	Ram high roof mini van
2017	1708	Light Duty	Ram high roof mini van
2017	1707	Light Duty	GMC Sevana 1500 full size van
2017	1703	Light Duty	Mercedes 2500 full size high roof van
2017	1702	Light Duty	Mercedes 2500 full size high roof van
2017	1701	Light Duty	Mercedes 2500 full size high roof van
2017	1705	Med Duty	Mercedes 3500 full size extended high roof van
2017	1704	Med Duty	Mercedes 3500 full size extended high roof van
2017	1719	Other	Trailer to tow back yard unit
2017	1610	Other	2015 DB37 Trailer 14K lb AltecTrailer
2018	1812	Light Duty	Ford full size high roof van
2018	1809	Light Duty	Chevrolet C2500 Heavy Duty (HD) 4WD Extended Cab Pickup Truck
2018	1808	Light Duty	Chevrolet C2500 HD 4WD Extended Cab Pickup Truck
2018	1807	Light Duty	Chevrolet C1500 HD 4WD Extended Cab Pickup Truck
2018	1806	Light Duty	Chevrolet C1500 HD 4WD Extended Cab Pickup Truck
2018	1805	Light Duty	Chevrolet C1500 HD 4WD Extended Cab Pickup Truck
2018	1801	Light Duty	Ram high roof mini van
2018	1804	Med Duty	Sprinter 3500 full size extended high roof van
2019	1901	Heavy Duty	65' Truck - Line truck RBD - Large
2019	1814	Heavy Duty	46’ Single bucket truck with material handler
2019	1813	Heavy Duty	46’ Single bucket truck with material handler

Year Purchased	Unit Number	Vehicle Category	Description
2019	1803	Heavy Duty	45' Single bucket with elevator and material handling
2019	1802	Heavy Duty	55' Truck - Line truck RBD - Large
2019	1905	Light Duty	Chevrolet C-2500 2019 PickupTruck - Service Body
2019	1811	Light Duty	Chevrolet C2500 4WD Extended Cab Pickup Truck
2019	1810	Light Duty	Chevrolet C2500 4WD Extended Cab Pickup Truck
2019	1903	Med Duty	Dodge Ram 3500 DualTruck - Service Body
2020 (projected)	n/a	Med Duty	Unit #2640 to be replaced - Step Van (walk through style)
2020 (projected)	n/a	Other	Unit # 2799 to be replaced - Outdoor forklift

b) The number of vehicles at the start of 2016 was 261. Table B outlines the number of Fleet vehicles at year-end from 2016-2020.

Table B – Number of Vehicles at Year-End (2016-2020)

Year	Ending Balance
2016	271
2017	288
2018	278
2019	275
2020	277

c) Table C provides the financial variances each year. Please note that 2019 represents actual expenditures, which have been updated from the projected amounts in Table 3 in Attachment 2-4-3(F): Fleet Replacement Program.

Table C – Summary of 2016-2019 Actual Spend vs. OEB-Approved Levels ($'000s)

	2016 Historical	2017 Historical	2018 Historical	2019 Historical	2020 Bridge[1]	Total
OEB-Approved Levels (EB-2015-0004)	$1,455	$1,209	$1,452	$1,480	$1,876	$7,472
Actual Capital Expenditure	$2,619	$1,584	$1,195	$562	$1,632	$7,592
Variance Over / (Under)	**$1,164**	**$375**	**$(257)**	**$(918)**	**$(244)**	**$120**

The faster than anticipated deterioration of a number of vehicles forced Hydro Ottawa to adjust its 2016-2020 plan, which was originally created in 2014. This adjustment involved advancing some acquisitions to 2016 and 2017, while delaying others in an attempt to balance the five-year approved envelope. In addition, Fleet continually works with operational staff to ensure that fleet replacements continue to meet functional and operational needs, which change over time and can result in variances from budget. This was the case in 2016 regarding an underground truck and trailer, where additional vehicle features were required to meet the operational needs (units 1602 and 1601, as shown in Table A above). In addition, units 1509, 1510, 1511, 1512, and 1513 (as shown in Table A above), were all advanced due to the deteriorating condition of the bucket trucks being replaced, as well as the demand for higher-reach buckets (the old bucket trucks that were being replaced only had a 55 ft reach). In 2017, a backyard unit was also purchased (unit 1720 as shown in Table A above). This backyard unit allows for safer and more efficient work in narrow, difficult-to-access areas such as residential backyards while not causing damage to the homeowner's landscape. This backyard unit was not included in the original budget drafted in 2014.

d) Hydro Ottawa owns all of its vehicles. The utility has looked at leasing opportunities; however, the fit-up and specific equipment installed on these fleet vehicles limits the types and models available (e.g. holes in body panels, cuts and fabrication to chassis, etc.). Moreover, Hydro Ottawa's experience has shown that the interest rates for leasing are higher than the cost of corporate borrowing.

[1] Figures for 2020 are based on projections.

INTERROGATORY RESPONSE - EPRF-32

2-EP-3

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 2

SUBJECT AREA: Distribution System Plan

Preamble:

There are currently 7 transformers operating beyond their expected service life of 55 years; this will increase to 62 transformers by the end of 2025 if no transformers are replaced under this program.

a) If Hydro Ottawa proceeds with its proposed station transformer replacement program, how many transformers will be beyond their expected service life of 55 years by the end of 2025.

b) Is the 55 year expected service life of a transformer based on industry standard or is it based on historical data on service lives of Hydro Ottawa transformers? If it is not based on Hydro Ottawa historical information, what is the expected service life of transformers based on Hydro Ottawa information?

c) Does Hydro Ottawa have only one type of station transformer in service from one manufacturer? If the answer is no, please list the types of station transformers that Hydro Ottawa has in service with the number of each type and the expected service life for each type. If there are differences in service life between manufacturers, please list them.

d) Is the age of the transformer the primary justification for a planned replacement? Please explain your answer.

RESPONSE:

a) Figure 1.4 in Attachment 2-4-3(E): Material Investments shows that approximately 28% of Hydro Ottawa transformers would be beyond their expected life if the utility proceeds with its proposed station transformer replacement program, which equates to 46 transformers at the end of 2025.

b) Hydro Ottawa's expected life of a transformer is 55 years, based on industry-derived probability of failure data. The expected life represents the age at which station transformers have a 1.5% probability of failure and pose an increased risk of failure.

From 2014-2018, Hydro Ottawa experienced two transformer failures – one at Startop station in 2015 and one at Leitrim station in 2016. The Startop transformer was one-year old and the failure was resolved without requiring replacement of the transformer. The Leitrim transformer was 24 years old and was replaced as a result of the failure.

c) Hydro Ottawa has transformers installed from multiple manufacturers at various voltage levels, and all are two-winding transformers. Please see Table A below for a summary of transformers broken down by manufacturer and voltage. There is no difference in the expected service life regardless of voltage or manufacturer.

Table A – Hydro Ottawa Transformer Manufacturer Summary

Manufacturer	Voltage Output (kV)				
	4.16	8.32	12.43	13.2	27.6
ABB	5	1	0	0	4
CGE	72	1	0	0	0
Siemens	0	3	0	0	1
Moloney Electric	0	10	0	0	0
Delta Star	0	1	0	0	0
CG Power Systems	0	4	0	0	1
Pioneer Electric	1	3	2	0	0
Virginia	2	5	0	0	1
Pauwels	0	0	0	2	3
TTI (Transelectrix)	0	1	0	0	2
Northern Transformer	2	2	1	0	1
PTI	2	1	0	0	0
Federal Pioneer	5	4	0	0	4
GE Energy	0	1	0	0	0
Hyundai	0	0	0	0	2
Westinghouse	4	1	0	0	2
Ferranti Packard	0	2	0	0	2
Prolec	0	2	0	0	0
Niagara Transformer Corp	4	0	0	0	0

d) Failure probability is the primary justification for planned transformer replacement. Both the age and health index of a transformer are used to determine the failure probability.

INTERROGATORY RESPONSE - EPRF-33

2-EP-4

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.2, page 5 and Table 1.6, page 12

SUBJECT AREA: Distribution System Plan

Preamble:

The station transformer renewal program will enable Hydro Ottawa to reduce transformer failures by replacing high-risk transformers before they fail. This will manage transformer failure risk to an acceptable level, and maintain low failure rates to meet customer expectations for reliability.

Why is Hydro Ottawa's target to "Maintain SAIFI and SAIDI" and not to improve them?

RESPONSE:

Hydro Ottawa is balancing cost versus performance by setting an appropriate pace for proactively renewing infrastructure to prevent future impacts to safety and reliability, while holding overall existing performance steady.

INTERROGATORY RESPONSE - EPRF-34

2-EP-5

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.3, page 7

SUBJECT AREA: Distribution System Plan

Preamble:

Figure 1.3 Station Transformer Failure Rate per Planned Replacement Level covers a period from 2018 to 2066.

a) Why was this period selected?

b) How many stations transformers does Hydro Ottawa have now and how many does it expect to have in 2066?

c) What is the accounting depreciation rate for station transformers?

d) Are the failure rates for 2018 and 2019 actual failure rates? If the answer is no please explain why?

e) Please file a figure similar to Figure 1.3 that shows the historical failure rates for Hydro Ottawa station transformers for the 20 years prior to 2018 or for as many years as there are records.

RESPONSE:

a) The period selected on the graph is from 2018 to 2067, representing a 50-year outlook. It was chosen to provide a consistent graph format for comparison between all asset classes, as many assets have an expected life of around 50 years.

b) As per page 1 of Attachment 2-4-3(E): Material Investments, Hydro Ottawa owns 167 station transformers. The number of transformers in 2066 will depend on future growth within Hydro Ottawa's service territory.

c) The accounting depreciation rate for station transformers is 2.2%.

d) The failure rate of 0.4 in 2018 represents the average number of failures per year between 2014 and 2018. All other failure rates, including 2019, are projections based on probability of failure curves.

e) Detailed historical data for the past 20 years is unavailable. However, in the period 2014-2018, Hydro Ottawa has experienced two transformer failures that resulted in transformer replacements.

INTERROGATORY RESPONSE - EPRF-35

2-EP-6

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 8

SUBJECT AREA: Distribution System Plan

Preamble:

Unplanned replacements are usually carried out by Hydro Ottawa's own crews, whereas planned replacements can be performed by both internal and external resources. The preferred alternative will lead to more planned renewal projects, where appropriate staffing resources can be allocated, rather than unplanned renewal projects that would take resources away from other work.

a) In Hydro Ottawa's experience with station transformer replacement projects what is the cost difference between using external resources instead of Hydro Ottawa's own crews?

b) Is the objective to have appropriate staffing levels a significant reason to avoid unplanned station transformer replacements?

RESPONSE:

a) The scope of work for planned projects between external and internal resources are typically different. For example, external contractors work on the civil portion of the project, while Hydro Ottawa crews would work on the electrical portion. As such, a direct comparison of the cost difference between external resources and Hydro Ottawa's own crews is not feasible.

b) Although having appropriate staffing levels is one reason to avoid unplanned transformer replacements, there are other significant reasons to avoid unplanned replacements. As described on page 8 of Exhibit 2-4-3(E): Material Investments, reducing reliability, safety, and financial risks are other significant reasons to avoid unplanned emergency replacements.

INTERROGATORY RESPONSE - EPRF-36

2-EP-7

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.8, page 16

SUBJECT AREA: Distribution System Plan

Please break down the $2.36 million cost estimate into the following components: materials, labour, overhead and interest during construction.

RESPONSE:

Table A below breaks down the $2.36M cost estimate into materials, labour, overhead and interest during construction.

Table A – Station Transformer Renewal Cost Breakdown ($'000,000s)

Program	Category	2021
Station Transformer Renewal	Materials	$0.49
	Labour	$1.61
	Overhead	$0.16
	Interest during construction	$0.10
TOTAL		**$2.36**

INTERROGATORY RESPONSE - EPRF-37

2-EP-8

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.9, page 19

SUBJECT AREA: Distribution System Plan

Preamble:

As shown in Figure 1.6, Figure 1.7, Figure 1.8, and Figure 1.9 below, 560 of Hydro Ottawa's station breakers are operating at or past their expected operating life. By 2025, the number of station breakers that will be at or past their expected life will increase to 561 if no planned replacements are made.

a) Please compare Hydro Ottawa's actual historical life of each of the four types of breakers with industry provided probabilities of failure listed in Table 1.9.

b) Please define the term "expected life" and explain what percentage of circuit breakers would fail when expected life is reached?

c) Please provide Hydro Ottawa's accounting depreciation rate for each type of breaker listed in Table 1.9.

d) If 560 station breakers are currently operating at or past their expected operating life and 561 will be operating at or past their expected life in 2025 if no replacements are made, does that mean that only one additional circuit breaker will reach its expected life between 2020 and 2025?

RESPONSE:

a) From 2014-2018, Hydro Ottawa has had eight station switchgear failures (average two per year), which include metalclad breakers, outdoor breakers, reclosers, and switches. Based on current demographics and probability of failure, there was expected to be 1.6 failures in 2018.

b) Hydro Ottawa defines the expected life of a circuit breaker as the age at which the breaker has a 1.5% probability of failure, according to probability of failure curves. The percent of breaker failures would be 1.5% or greater.

c) Hydro Ottawa's accounting depreciation rate for all types of breaker listed in Table 1.9 is 2.5%.

d) Yes, from the analysis, only one additional circuit breaker will reach its expected life between 2020 and 2025.

INTERROGATORY RESPONSE - EPRF-38

2-EP-9

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.6, page 20

SUBJECT AREA: Distribution System Plan

a) Does the information in Figure 1.6 indicate that a majority of Hydro Ottawa's station oil breakers have exceeded the industry predicted expected life? If the answer is yes, does that mean that the industry predicted expected life may need to be revised? If the answer is no, please explain your answer.

b) Is circuit breaker age the main criteria for replacement?

RESPONSE:

a) The information in Figure 1.6 indicates that a majority of Hydro Ottawa's station oil breakers have exceeded the utility's expected life for that asset. No, the expected life does not need to be revised, as it is only an indicator that there is an increased risk to failure for those assets that have exceeded that threshold.

b) No, the criteria for replacement is based on a combination of Health Index and age.

INTERROGATORY RESPONSE - EPRF-39

2-EP-10

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.13, page 27

SUBJECT AREA: Distribution System Plan

a) Please file a figure similar to Figure 1.33 that shows the historical failure rates for Hydro Ottawa circuit breakers for the 20 years prior to 2018 or for as many years as there are records.

b) Figure 1.13 implies a certain accuracy in forecasting. Please explain the reason for the sharp reduction in the number of circuit breaker failures in 2053 for the preferred alternative of 13 assets/year scenario.

RESPONSE:

a) Historical data for the past 20 years is unavailable. However, in the period of 2014-2018, Hydro Ottawa experienced eight breaker failures.

b) The sharp reduction in the number of circuit breaker failures in 2053 noted in Figure 1.13 on page 27 of Attachment 2-4-3(E): Material Investments is caused by the rate of renewal and how it compares to the number and timing of assets reaching the end of their expected life. Since the failure projections of circuit breakers are closely tied to breaker age, the cumulative number of expected failures in a certain year will be higher where there is a larger number of breakers with the same age. Once the majority of older assets are replaced, the rate of expected failure will decline rapidly if the remainder of the installed assets are of a significantly newer vintage.

INTERROGATORY RESPONSE - EPRF-40

2-EP-11

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.11, page 30

SUBJECT AREA: Distribution System Plan

a) Are all switchgear replacement units identical? If the answer is no, please list different types of switchgear replacement units with the cost of each type.

b) Please explain the disconnect between annual program costs and the number of switchgear replacement units.

RESPONSE:

a) All switchgear in Table 1.11 are metalclad switchgear with vacuum-type breakers; however, they vary by voltage rating, number of breakers per switchgear unit, and manufacturer. The project costs and associated unit costs are captured in Table A below.

Table A – Switchgear Project and Unit Costs

Project	# of Cells	Cost of Switchgear	Unit Cost
Overbrook TO	36	$3,420,000	$95,000
Bells Corners Rebuild	18	$2,413,000	$134,056
Dagmar (assumed to be like-for-like replacement)	22	$2,337,000	$106,227
Shillington (assumed to be like-for-like replacement)	17	$1,873,000	$110,176

b) Switchgear renewals are typically multi-year projects. The units are only counted on the year in which the project is energized and therefore capitalized. As a result, some years will have capital expenditures associated with them without an associated unit installed.

INTERROGATORY RESPONSE - EPRF-41

2-EP-12

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 33

SUBJECT AREA: Distribution System Plan

Preamble:

This graph was made with the assumption that all breakers have an expected life of 42 years, regardless of their type.

a) Are all types of breakers fully depreciated after 42 years?

b) What is Hydro Ottawa's accounting treatment for retirement of breakers that are not fully depreciated?

RESPONSE:

a) Yes, all types of breakers are fully depreciated after 42 years. They are depreciated at 2.5%, which is 40 years of financial life.

b) If a breaker were not fully depreciated and retired, the following accounting transaction would be booked, using an example of an initial breaker cost of $100,000, accumulated depreciation of $90,000, and the net book value of $10,000:

Debit	Accumulated Depreciation	$90,000
Debit	Net Book Value - Derecognized Assets	$10,000
Credit	Fixed Assets	$100,000

As per the above example, Hydro Ottawa's accounting treatment for retirement of breakers that are not fully depreciated is to expense the net book value of the breaker.

INTERROGATORY RESPONSE - EPRF-42

2-EP-13

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.16, page 36

SUBJECT AREA: Distribution System Plan

Please break down the $6.7 million cost estimate into the following components: materials, labour, overhead and interest during construction.

RESPONSE:

Please see Table A below for a breakdown of the $6.7M cost estimate of the Station Switchgear Renewal Project described in Table 1.16 of Attachment 2-4-3(E): Material Investments.

Table A – Station Switchgear Cost Estimate Breakdown ($'000,000's)

Category	Test Period				
	2021	2022	2023	2024	2025
Materials	$0.34	$0.48	$0.36	$0.26	$0.01
Labour	$1.09	$1.53	$1.16	$0.84	$0.02
Overheads	$0.11	$0.15	$0.12	$0.08	$0.00
Interest during construction	$0.02	$0.08	$0.02	$0.02	$0.00
TOTAL	**$1.57**	**$2.24**	**$1.67**	**$1.20**	**$0.03**

INTERROGATORY RESPONSE - EPRF-43

2-EP-14

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.16, page 40

SUBJECT AREA: Distribution System Plan

a) Please confirm that Figure 1.16 indicates that electromechanical relays have hasted much longer than expected.

b) Are electromechanical relays fully depreciated at the expected life of 40 years?

RESPONSE:

a) Yes, due to regular maintenance activities the electromechanical relays have lasted longer than expected.

b) Yes, electromechanical relays are fully depreciated at the expected life of 40 years.

INTERROGATORY RESPONSE - EPRF-44

2-EP-15

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.19, page 45

SUBJECT AREA: Distribution System Plan

Please explain the disconnect between annual program costs and the number of P&C relay replacement units.

RESPONSE:

The inconsistency in the annual program cost and the number of proposed replacement units results from individual assessment of proposed projects. Each of the proposed projects has a varied degree of complexity resulting from annual budget variations in cost per unit ratio. The annual program cost also includes replacement of station remote terminal units ("RTUs"), which require substantially higher unit replacement cost than the relays.

Please refer to Table 1.21 on page 48 of Attachment 2-4-3(E): Material Investments for a detailed list of five-year proposed projects.

INTERROGATORY RESPONSE - EPRF-45

2-EP-16

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.31, page 69

SUBJECT AREA: Distribution System Plan

Please break down the $33.4 million cost estimate into the following components: materials, labour, overhead and interest during construction.

RESPONSE:

Please see Table A below for a breakdown of the $33.4M cost estimate of the Station Major Rebuild Project described in Table 1.31 of Attachment 2-4-3(E): Material Investments.

Table A – Station Major Rebuild Project - Cost Estimate Breakdown ($'000,000s)

Category	Test Period				
	2021	2022	2023	2024	2025
Materials	$2.34	$4.27	$3.19	$2.74	$4.39
Labour	$1.90	$3.46	$2.59	$2.22	$3.56
Overheads	$0.23	$0.43	$0.32	$0.27	$0.44
Interest during construction	$0.25	$0.18	$0.10	$0.20	$0.31
Total	**$4.72**	**$8.34**	**$6.19**	**$5.44**	**$8.70**

INTERROGATORY RESPONSE - EPRF-46

2-EP-17

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, pages 76 and 77

SUBJECT AREA: Distribution System Plan

Preamble:

Hydro Ottawa has considered the following scenarios:

- *Only reactively replace poles that have failed;*
- *Reactively replace poles that have failed with the proactive planned replacement of 400 poles on a like-for-like basis;*
- *Reactively replace poles that have failed with the proactive planned replacement of 700 poles on a like-for-like basis;*
- *Reactively replace poles that have failed with the proactive planned replacement of 850 poles on a like-for-like basis.*

a) Has Hydro Ottawa carried out a discounted cash flow analysis of the four pole replacement scenarios? If the answer is yes, please file it. If the answer is no, please explain why not.

b) Was the impact on SAIFI considered in the selection of the preferred scenario? If the answer is yes, please file the estimated impact on SAIFI that was considered. If the answer is no, please explain why not.

RESPONSE:

a) No, Hydro Ottawa has not carried out a discounted cash flow analysis of the four pole replacement scenarios, as the utility does not endeavour to run poles to failure. A discounted cash flow analysis would clearly indicate that only reactively replacing poles that have failed would be the ideal scenario; however, this does not align to Hydro Ottawa's asset management approach. Alternatively, Hydro Ottawa also considers the increased safety, financial, reliability, resource, and environmental impacts of running to failure and therefore strives to levelize the rate of replacement and minimize the number of unexpected failures requiring unplanned replacement. In brief, through proactive, planned, and levelized asset renewal, Hydro Ottawa endeavors to minimize asset renewal costs while meeting reliability, safety, and environmental objectives.

b) Yes, the impact on SAIFI was qualitatively considered in the evaluation of the scenario of only reactively replacing poles that have failed versus the three alternative options which include proactive planned replacement.

INTERROGATORY RESPONSE - EPRF-47

2-EP-18

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.35, page 80

SUBJECT AREA: Distribution System Plan

Please expand the Planned Pole Renewal Table 1.35 by breaking down the annual expenditure line into capital, labour, overheads, and interest during construction, and by showing the cost per unit for each year.

RESPONSE:

Please see Table A below for a breakdown of Planned Pole Renewal, as initially presented in Table 1.35 of Attachment 2-4-3(E): Material Investments.[1]

Table A – Historical, Approved, and Projected Expenditure for Planned Pole Renewal (Expanded)

Category	Historical ($'000s)			Bridge ($'000s)		Test ($'000s)				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capital	$2,208.2	$2,421.4	$1,749.3	$1,302.3	$1,259.1	$1,448.7	$1,456.8	$1,456.8	$1,456.8	$1,456.8
Labour	$7,532.3	$6,830.8	$7,585.7	$4,053.2	$4,908.4	$5,647.6	$5,679.4	$5,679.4	$5,679.4	$5,679.4
Overheads	$1,304.5	$1,233.1	$1,122.7	$831.0	$750.5	$902.6	$907.7	$907.7	$907.7	$907.7
Interest During Construction	$21.5	$30.4	$0.1	$3.8	$0	$0	$0	$0	$0	$0
TOTAL	**$11,066.4**	**$10,515.7**	**$10,457.9**	**$6,190.4**	**$6,917.9**	**$7,999.0**	**$8,044.0**	**$8,044.0**	**$8,044.0**	**$8,044.0**
Units Replaced	498	506	355	354	362	400	400	400	400	400
Cost per Unit	**$22.2**	**$20.8**	**$29.5**	**$17.5**	**$19.1**	**$20.0**	**$20.1**	**$20.1**	**$20.1**	**$20.1**

Note of the categories appearing in the table, 'Labour' captures the costs of both Hydro Ottawa internal labour and external contracted labour, 'Capital' captures the costs of material required

[1] Hydro Ottawa has revised Table 1.35, as per this interrogatory request. To confirm, these revisions should not be interpreted as replacing Table 1.35 in Hydro Ottawa's original Application.

to complete the work, ‘Overheads’ captures indirect project costs including supervisory and engineering burdens and trucking costs, and ‘Interest During Construction’ captures Allowance for Funds Used During Construction (“AFUDC”) costs associated with completing the work.

INTERROGATORY RESPONSE - EPRF-48

2-EP-19

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.42, page 94

SUBJECT AREA: Distribution System Plan

Please expand the Overhead Switch Renewal Table 1.42 by breaking down the annual expenditure line into capital, labour, overheads, and interest during construction, and by showing the cost per unit for each year.

RESPONSE:

Please see Table A below for a breakdown of the Overhead Switch Renewal as originally presented in Table 1.42 of Attachment 2-4-3(E): Material Investments.[1] Please note the units replaced are based on inventory issued to jobs. The unit cost calculation below was reached by taking total costs incurred in the period divided by the number of units issued in the same period. This may cause misalignment as the costs may occur the periods before or after the stock issued. The fluctuation in unit costs between 2018 and 2019 are examples. Based on the four-year average from 2016-2019, the unit costs were calculated to be $1.99.

[1] Hydro Ottawa has revised Table 1.42, as per this interrogatory request. To confirm, these revisions should not be interpreted as replacing Table 1.42 in Hydro Ottawa's original Application.

Table A – Historical, Approved, and Projected Expenditure for Planned Overhead Switch Renewal (Expanded)

Category	Historical ($'000s)			Bridge ($'000s)		Test ($'000s)				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capital	$196.2	$148.8	$0.3	$133.4	$0.0	$0.0	$163.5	$163.5	$173.5	$0.0
Labour	$181.6	$89.5	$13.2	$165.5	$0.0	$0.0	$532.9	$532.9	$565.5	$0.0
Overheads	$64.1	$29.9	$1.1	$26.4	$0.0	$0.0	$54.5	$54.5	$57.8	$0.0
Interest During Construction				$0.9						
TOTAL	**$441.9**	**$268.2**	**$14.5**	**$326.2**	**$0.0**	**$0.0**	**$750.9**	**$750.9**	**$796.9**	**$0.0**
Units Replaced	249	136	92	52	0	0	375	375	398	0
Cost per Unit	$1.77	$1.97	$0.16	$6.26			$2.00	$2.00	$2.00	

INTERROGATORY RESPONSE - EPRF-49

2-EP-20

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.52, page 110

SUBJECT AREA: Distribution System Plan

Please provide a table that breaks down the Vault Renewal $2,479,899 cost estimate into the following elements: capital, labour, overheads, and interest during construction for each year. Please show how many vaults are being renewed each year.

RESPONSE:

Hydro Ottawa does not quantify its Vault Renewal program in terms of vaults renewed, but in terms of the resulting number of assets renewed. The focus of the program during the period described in Table 1.52 of Attachment 2-4-3(E): Material Investments is the renewal of vault transformers. The number of affected vaults is estimated by assuming there are typically three transformers per vault.

With this caveat in hand, Hydro Ottawa has prepared Table A below in response to the interrogatory request.

Table A – Vault Renewal Cost Breakdown ($'000s)

Category	Test Year				
	2021	2022	2023	2024	2025
Capital	$290.6	$290.6	$290.6	$290.6	$290.6
Labour	$165.0	$165.0	$165.0	$165.0	$165.0
Overheads	$40.4	$40.4	$40.4	$40.4	$40.4
Interest During Construction	$0.0	$0.0	$0.0	$0.0	$0.0
TOTAL	**$496.0**	**$496.0**	**$496.0**	**$496.0**	**$496.0**
Units Replaced	25	25	25	25	25
Cost per Unit	$19.84	$19.84	$19.84	$19.84	$19.84
Number of Vaults Affected	8.3	8.3	8.3	8.3	8.3

Note the following explanations for the categories appearing in the table above:

- "Labour" captures the costs of both Hydro Ottawa internal labour and external contracted labour;
- "Capital" captures the costs of material required to complete the work;
- "Overheads" captures indirect project costs including supervisory and engineering burdens and trucking costs; and
- "Interest During Construction" captures Allowance for Funds Used During Construction ("AFUDC") costs associated with completing the work.

INTERROGATORY RESPONSE - EPRF-50

2-EP-21

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.60, page 112

SUBJECT AREA: Distribution System Plan

a) Please explain how Hydro Ottawa determined that the expected service life of a cable chamber is 52 years.

b) Are all cable chambers identical and do they all have the same expected service life?

RESPONSE:

a) Hydro Ottawa determined that the expected service life of a cable chamber is 52 years based on its probability of failure exceeding 2%, as per the description found on page 22 of Attachment 2-4-3(G): Strategic Asset Management Plan.

b) Hydro Ottawa uses a variety of cable chambers types and sizes that all have the same expected service life.

INTERROGATORY RESPONSE - EPRF-51

2-EP-22

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.60, page 123

SUBJECT AREA: Distribution System Plan

Please provide a breakdown of the Civil Renewal $5,050,351 cost estimate into the following components: capital, labour, overhead, and interest during construction.

RESPONSE:

See Table A below for a breakdown of the Civil Renewal cost estimate described in Table 1.60 of Attachment 2-4-3(E): Material Investments.

Table A – Breakdown of Civil Renewal Estimated Expenditures ($'000s)

Category	Test Year				
	2021	2022	2023	2024	2025
Capital	$37.5	$37.5	$37.5	$37.5	$37.5
Labour	$892.2	$892.2	$892.2	$892.2	$892.2
Overheads	$80.4	$80.4	$80.4	$80.4	$80.4
Interest During Construction	$0.0	$0.0	$0.0	$0.0	$0.0
TOTAL	**$1,010.1**	**$1,010.1**	**$1,010.1**	**$1,010.1**	**$1,010.1**

Note the following explanations for the categories appearing in the table above:

- "Labour" captures the costs of both Hydro Ottawa internal labour and external contracted labour;
- "Capital" captures the costs of material required to complete the work;

- "Overheads" captures indirect project costs including supervisory and engineering burdens and trucking costs; and
- "Interest During Construction" captures Allowance for Funds Used During Construction ("AFUDC") costs associated with completing the work.

INTERROGATORY RESPONSE - EPRF-52

2-EP-23

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.50, page 133

SUBJECT AREA: Distribution System Plan

Why do failure rates for three scenarios decline between 2055 and 2063 and then start increasing?

RESPONSE:

The noted decrease and increase in Figure 1.50 on page 133 of Attachment 2-4-3(E): Material Investments is caused by the rate of renewal and how it compares to the number and timing of assets reaching the end of their expected life. Focusing on scenarios where the pace of asset renewal is slower than the pace of assets reaching the end of their expected life, a gradual increase in expected failures would be experienced. Once the majority of these assets are replaced, the rate of expected failure may hold at a given rate or may decline. The failure rate once again increases when the next group of assets with similar age begin to approach the end of their expected life, starting the cycle once more.

INTERROGATORY RESPONSE - EPRF-53

2-EP-24

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Figure 1.51, page 134

SUBJECT AREA: Distribution System Plan

a) Please explain the reason for the sharp reduction followed by a sharp increase in the number of failures in 2066.

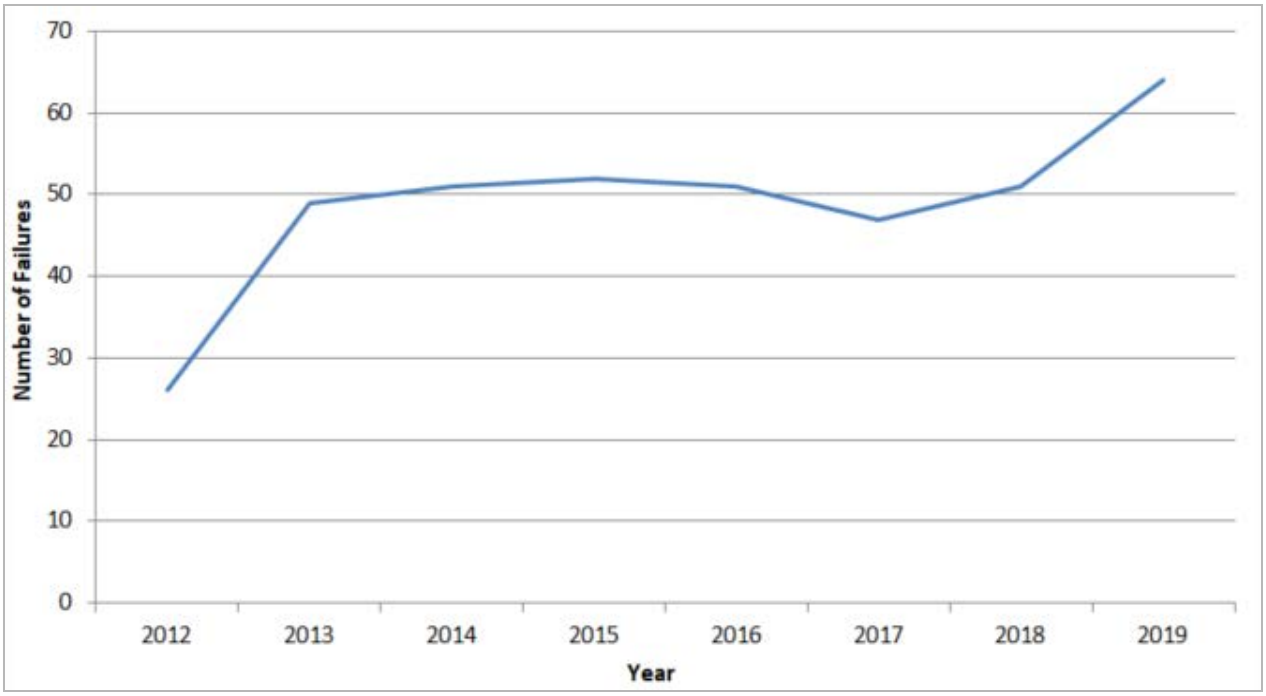
b) Please file a figure similar to Figure 1.51 that shows the Hydro Ottawa historical underground cable failure rates for all types of cables for the 20 years prior to 2018 or for as many years as there are records.

RESPONSE:

a) Please refer to the response to interrogatory EPRF-52.

b) Detailed historical data for the past 20 years is unavailable. However, over the 2012-2019 period, Hydro Ottawa has experienced the number of cable failures shown in Figure A below. This graph has been constructed using historical outage data including the aggregate number of failures for all underground cable types.

1 **Figure A – Historical Number of Underground Cable Faults Causing Outages per Year**

2 

3

INTERROGATORY RESPONSE - EPRF-54

2-EP-25

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.65, page 138

SUBJECT AREA: Distribution System Plan

Please file Table 1.65 with the $ cost/ km line added.

RESPONSE:

Table A provides a copy of Table 1.65 found in Attachment 2-4-3(E): Material Investments, reproduced to include cost per km renewed.

Table A – Expenditure History of Comparative Projects ($'000,000s)

	Historical				Bridge	Test				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Planned Expenditure	$6.42	$6.18	$7.22	$3.63	$6.21	$8.97	$8.45	$9.05	$8.97	$8.97
Planned Replacements (km)	37.0	15.6	25.5	13.9	14.7	26.0	26.0	26.0	26.0	26.0
Other Planned Programs (km)	4.6	2.8	4.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unit Cost per km Replaced	$0.15	$0.34	$0.24	$0.26	$0.42	$0.35	$0.33	$0.35	$0.35	$0.35

INTERROGATORY RESPONSE - EPRF-55

2-EP-26

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.68, page 143

SUBJECT AREA: Distribution System Plan

Please provide a table that breaks down the Underground Cable Replacement $44,413,624 cost estimate into the following components: capital, labour, overhead, and interest during construction.

RESPONSE:

See Table A below for a breakdown of the Underground Cable Replacement cost estimate described in Table 1.68 of Attachment 2-4-3(E): Material Investments.

Table A – Breakdown of Underground Cable Replacement Estimated Expenditures ($'000s)

Category	Test Year				
	2021	2022	2023	2024	2025
Capital	$1,186.6	$1,118.1	$1,197.5	$1,186.3	$1,186.0
Labour	$7,080.8	$6,671.9	$7,145.3	$7,078.5	$7,076.8
Overhead	$704.1	$663.5	$710.6	$703.9	$703.8
Interest During Construction	$0.0	$0.0	$0.0	$0.0	$0.0
TOTAL	**$8,971.6**	**$8,453.5**	**$9,053.3**	**$8,968.7**	**$8,966.6**

Note the following definitions for the categories appearing in the table above:

- "Labour" captures the costs of both Hydro Ottawa internal labour and external contracted labour;
- "Capital" captures the costs of material required to complete the work;

- "Overheads" captures indirect project costs including supervisory and engineering burdens and trucking costs; and
- "Interest During Construction" captures Allowance for Funds Used During Construction ("AFUDC") costs associated with completing the work.

INTERROGATORY RESPONSE - EPRF-56

2-EP-27

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 150

SUBJECT AREA: Distribution System Plan

Preamble:

The main driver for this program is to replace assets that are at the end of their service life. The secondary drive for this program is reliability.

Does reliability decrease linearly with the length of service or is there a sharp drop in reliability at the end of service life?

RESPONSE:

No, reliability of an asset does not typically decrease linearly with the length of service, nor is there a sharp drop in reliability when it reaches the end of its service life. Assets are replaced when their condition (which factors in age) indicates that their probability of failure exceeds Hydro Ottawa's threshold, as described in Attachment 2-4-3(G): Strategic Asset Management Plan (see page 22). Assets are therefore replaced at the end of their service life in order to avoid the heightened probability of unforeseen asset failure.

INTERROGATORY RESPONSE - EPRF-57

2-EP-28

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.80, page 165, and Table 1.81, page 166

SUBJECT AREA: Distribution System Plan

Please explain why the Emergency Renewal Program and the Critical Renewal Program have no O&M costs if "the asset is repaired, refurbished, or replaced" as stated in Tables 1.80 and 1.81.

Please provide a table that breaks down the Emergency Renewal Program $4,482,000 cost estimate and the Critical Renewal Program $4,297,000 cost estimate into the following components: capital, labour, overhead, and interest during construction.

RESPONSE:

The Emergency Renewal Program and the Critical Renewal Program have no O&M costs associated with them because they are capital only programs. O&M costs associated with assets that are repaired and refurbished are captured under other program business units.

Please see Table A below for a breakdown of the Emergency Renewal cost estimate described in Table 1.80 of Attachment 2-4-3(E): Material Investments.

Table A – Emergency Renewal Program Breakdown

Category	Total
Capital	$1,079,598
Labour	$2,822,155
Overheads	$580,104
Total	**$4,481,857**

Please see Table B below for a breakdown of the Critical Renewal cost estimate described in Table 1.81 of Attachment 2-4-3(E): Material Investments.

Table B – Critical Renewal Program Breakdown

Category	Total
Capital	$1,040,375
Labour	$2,699,152
Overheads	$557,945
Total	**$4,297,472**

INTERROGATORY RESPONSE - EPRF-58

2-EP-29

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 195

SUBJECT AREA: Distribution System Plan

Preamble:

Conversely, the do nothing option would cost $324,490 per year in maintenance costs and continue to tie up technician time in meter maintenance.
Additionally, Hydro Ottawa will continue to pay $264K per year to operate the phone lines, have meters with limited outage management capabilities and customer functions.

Are the $324,490 per year and the $264K per year savings in O&M that will accrue to the shareholder? Please explain your answer.

RESPONSE:

a) By eliminating the need for phone lines and switching to cell phone modems, the overall O&M cost to the Metering System group will be reduced by $264k per year upon project completion.

In addition, there will no longer be a need to perform repairs on the phone lines. The overall anticipated savings of the phone line and reduced maintenance is $324,490 per year.

With respect to whether the savings will accrue to the shareholder, this is an instance in which the utility's planned Earnings Sharing Mechanism ("ESM") would come into play. In the event that the savings associated with this activity help contribute to net earnings

in excess of Hydro Ottawa's regulated return on equity ("ROE"), then the provisions of the ESM governing the sharing of earnings with ratepayers would apply. For more information on Hydro Ottawa's proposed ESM for the 2021-2025 rate term, please see UPDATED Exhibit 9-1-3: Group 2 Accounts.

INTERROGATORY RESPONSE - EPRF-59

2-EP-30

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.107, page 198

SUBJECT AREA: Distribution System Plan

Will the write-offs in 2021 and 2022 be expensed or charged against accumulated depreciation?

RESPONSE:

The write-off related to the self-contained meter phone line will be expensed.

INTERROGATORY RESPONSE - EPRF-60

2-EP-31

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.110, page 205

SUBJECT AREA: Rate Base

Preamble:

Finally, this project will permanently reduce inventory overhead one-time by $ 263K.

Is inventory part of Working Capital or some other component of Rate Base and will this project reduce Rate Base by $263K?

RESPONSE:

The inventory referenced above is not related to OM&A or other revenue. As such, it is included as construction in progress which is not part of Rate Base nor is it used in the calculation of the allowance for working capital. Rate Base will not be reduced by $263K.

INTERROGATORY RESPONSE - EPRF-61

2-EP-32

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 1.111, page 206

SUBJECT AREA: Distribution System Plan

a) Please convert the labour hours into labour costs.

b) Are labour costs Capital or O&M costs?

RESPONSE:

a) Converted labour costs are estimated to be $58,144 in 2021 and $47,280 for 2022.

b) The labour costs for the Transformer-Related Meter Phone Line Elimination Work Plan will be capital costs.

INTERROGATORY RESPONSE - EPRF-62

2-EP-33

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 206 and Table 1.112, Page 208

SUBJECT AREA: Distribution System Plan

Please reconcile the 33,330 Rex 1 meters mentioned in the Project Scope on Page 206 with the 6,600 units per year from 2021 to 2025 shown in Table 1.112 on page 208.

RESPONSE:

The 33,330 is a typographical error and should read 33,300, as stated above in the project summary section and the table.

INTERROGATORY RESPONSE - EPRF-63

2-EP-34

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Page 209

SUBJECT AREA: Distribution System Plan

Preamble:

The primary risk to project completion is a shortage of labour due to the prioritization of reactive maintenance work or other capital work. To mitigate this risk, Hydro Ottawa can distribute the work to an independent contractor.

a) How does Hydro Ottawa decide which work would be done by an independent contractor?

b) Is all work that is done by independent contractor tendered?

c) Please provide a cost comparison between Hydro Ottawa's hourly fully burdened labour costs and the labour costs charged by independent contractors to Hydro Ottawa.

RESPONSE:

a) Hydro Ottawa does not employ any independent contractors to perform work under the Metering Renewal program at this time. With respect to the use of independent contractors in other areas of the business, Hydro Ottawa primarily utilizes contractors for activities which require special tools, training, or equipment that internal crews are not equipped to perform. Hydro Ottawa may also employ contractors in a supplementary fashion when there is an insufficient amount of internal resources available to complete capital projects or maintenance activities.

b) Work performed by independent contractors is procured in accordance with Attachment 4-2-2(A): Procurement Policy, Attachment 4-2-2(B): Approval Authority for Procurements and Disbursements, and Attachment 4-2-2(c): Procurement Process. As per the utility's Procurement Policy, Procurement is responsible for ensuring that goods and services are acquired using the appropriate procurement method, which includes, but is not limited to, RFP (Request for Proposal), RFQ (Request for Quote), and RFI (Request for Information). Non-competitive procurement requests must be approved through a Sole Source or Directed Source process.

c) No comparison can be performed, as there are no contractors employed to perform work under this specific program at this time.

INTERROGATORY RESPONSE - EPRF-64

2-EP-35

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Page 216

SUBJECT AREA: Distribution System Plan

Please provide a table that lists all projects with cost estimates in the Distribution System Plan where the main driver is System Standardization. Please calculate the total cost and provide it.

RESPONSE:

The projects listed under Attachment 2-4-3(E): Material Investments, Section 1.5.1.1 Metering Standardization, Section 1.5.1.2 2.5 EL to 3EL, and Section 1.5.1.6 Transformer Rated to Self-Contained 200A Services have the driver listed as System Standardization. A breakdown of the planned expenditures by project, including project total, is provided in Table A below. In this case, the term “System Standardization” is synonymous with the term “Functional Obsolescence.”

Table A – Summary of Expenditures by System Standardization Driver ($'000s)

Projects	Test Year				
	2021	2022	2023	2024	2025
C Phase Reversal	$0	$0	$0	$35	$0
1 Element to 1.5 Element Upgrade	$22	$25	$4	$22	$85
GRex Upgrade	$0	$0	$0	$0	$360
Ion Upgrade	$125	$0	$0	$19	$0
Fleet Standardization	$0	$0.7	$33	$12	$3
Transformer Rated to Self Contained 200A Services	$226	$226	$226	$226	$226
TOTAL COST	**$373**	**$252**	**$263**	**$314**	**$674**

INTERROGATORY RESPONSE - EPRF-65

2-EP-36

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Page 218, and Exhibit 3, Tab 1, Schedule 1, Table 2, Page 3.

SUBJECT AREA: Distribution System Plan

Preamble:

The prioritized projects under the Station Capacity Upgrades Program alleviate short to long term capacity constraints within Hydro Ottawa's distribution system.

Please reconcile need for the Station Capacity Upgrades Program with the forecast of load growth shown in Exhibit 3, Tab 1, Schedule 1, Table 2.

RESPONSE:

Please note that Table 2 in UPDATED Exhibit 3-1-1: Load Forecast only represents the annual billing demand for customer rate classes that are billed the variable distribution charge based on their peak monthly demand.

As indicated in Attachment 2-4-3(E): Material Investments, beginning on page 218, the primary focus of the Station Capacity Upgrades Program is on new station capacity under the Cambrian MTS project (previously named South Nepean MTS) in Nepean South and the New East Station in Leitrim. It is also focused on additional station capacity at existing stations such as Limebank MTS, Uplands MTS, and Riverdale TS. The need for these additions or upgrades is identified through the System Capacity Assessment and the Integrated Regional Resource Plan ("IRRP") produced by the IESO.[1]

[1] For a copy of the latest IRRP issued by the IESO for the Greater Ottawa area, please see Attachment PP-11(A): Ottawa Sub-Region 2020 IRRP.

In total, Hydro Ottawa plans to invest an estimated $55.1M in station capacity upgrades over the 2021-2025 rate period. The Cambrian MTS and New East Station account for $38.7M or 70.3% of the estimated planned expenditures. Both of these projects will remove load from existing stations that are already seeing capacity constraints resulting from historical customer growth, while also accommodating forecasted new growth.

While Hydro Ottawa's Load Forecast, as outlined in UPDATED Exhibit 3-1-1, shows a relatively flat or declining curve, this is the net result of customer growth with a declining customer average use. While average use decreases are felt throughout the utility's service territory, growth typically occurs in pockets and results in capacity constraints at the station level. Specifically, the New East Station is dealing with the capacity constraints at the edges of Hydro Ottawa's service territory, while Cambrian MTS is required to accommodate customer load growth and increase supply capacity in the South Nepean area of Ottawa, which has already reached the limits of local transformation capacity. The latter project has already received Leave to Construct approval from the OEB.[2]

The second distinction to be made is that system capacity is evaluated on the potential geographic coincident peak of the assets being evaluated, while the Load Forecast is based on monthly non-coincident billing peak demand across the entire service territory.

[2] Ontario Energy Board, *Decision and Order*, EB-2019-0077 (October 17, 2019).

INTERROGATORY RESPONSE - EPRF-66

2-EP-37

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, Table 2.1, Page 220

SUBJECT AREA: Distribution System Plan

Please provide an estimate of the improvement in SAIFI/SAIDI that the proposed System Service projects are expected to achieve together with the total cost of all proposed System Service projects that will be needed to achieve this improvement.

RESPONSE:

Hydro Ottawa has not set an improvement level for SAIFI/SAIDI that is expected to be achieved with the completion of all System Service projects. Many System Service projects are associated with expanding the distribution system to accommodate future growth and increasing the operability of this expanded system. It is not possible to forecast reliability improvements for a system that has no historical performance and that is yet to be put into place to accommodate growth that has yet to materialize. Hydro Ottawa uses planning best practices to ensure that future expansion of the distribution system is done in ways that address reliability performance.

INTERROGATORY RESPONSE - EPRF-67

2-EP-38

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 344, and Table 2.53, page 348, and Table 2.55, page 352, and Exhibit 2, Tab 4, Sch. 3, Att. E, 2.3.3, Updated, pages 1 and 2

SUBJECT AREA: Distribution System Plan

Preamble:

The Smart Grid Fund Initiatives program is designed to provide a funding stream for a portfolio of innovation initiatives. These innovation initiatives will provide for the enhancement of tools, technologies, training, or processes in a system operating context that are core to Hydro Ottawa operations and effectiveness. In addition to having a continued internal funding mechanism, Hydro Ottawa will pursue external innovation funding sources such as provincial and federal governments and non-government organizations (e.g Natural Resources Canada, Ontario Ministry of Energy or Independent Electricity System Operator of Ontario).

The Smart Energy Roadmap, is the integrated "whole of company" plan to achieve Hydro Ottawa's Smart Energy vision. This vision is articulated in the company's Strategic Direction 2016-2020, which also offers the following definition of "smart energy": "an energy system that makes effective use of available technologies to maximize consumer, community and environmental benefit. It is sustainable, customer-centric, reliable, cost-effective, secure, and constantly evolving.

a) Is there a possibility that provincial and federal governments would provide funding for some or all of the cost? If the answer is yes, would it be treated as a capital contribution?

b) Please confirm that Hydro Ottawa energy system needs to change because it does not make effective use of available technologies to maximize consumer, community, and

environmental benefit. It is not sustainable, customer-centric, reliable, cost-effective, secure, and is not constantly evolving.

RESPONSE:

a) Monies received from a funding agency will be accounted for in accordance with International Financial Reporting Standards. If the funding is for capital materials or activities, it will be treated as capital contribution.

b) Hydro Ottawa does effectively use technology for creating a more sustainable, customer-centric, reliable, cost-effective, and secure energy system. The utility's energy system is undergoing constant expansion or improvement. The energy system is large and improvements are incremental, as it is not feasible to change the entire system at once. Accordingly, energy system solutions are constantly evolving on account of the dynamic nature of the system, new developments in material or technology options, and the shift in government policy, legislation, regulation, and/or incentives. The constraints on selecting the optimal solution are likewise constantly changing. Hydro Ottawa is therefore continually evaluating solutioning options against its smart grid evaluation criteria.

INTERROGATORY RESPONSE - EPRF-68

2-EP-39

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, page 346

SUBJECT AREA: Distribution System Plan

Preamble:

Reliability: The primary strategic outcome sought by the Smart Energy Roadmap is the target of developing enhanced grid reliability, and service offerings to enable the provision of 100% reliable electrical service.

Please define the term 100% reliable electrical service in terms of SAIDI and SAIFI.

Please provide a summary table that lists all components of the Smart Energy Roadmap including the cost and timing of each component.

RESPONSE:

Hydro Ottawa's Smart Energy Roadmap target of 100% reliable electrical service means values for SAIDI and SAIFI of zero. This is a continuous stretch goal to ensure that the utility is always striving to make improvements and be innovative in its strategy.

For the Smart Energy Roadmap, please refer to the response to interrogatory OEB-114 part (a).

INTERROGATORY RESPONSE - EPRF-69

2-EP-40

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, s 2.3 Updated, page 12

SUBJECT AREA: Distribution System Plan

Preamble:

Overall, the MiGen program will help evolve the grid from being load-following to supply-following.

a) Please explain how Hydro Ottawa currently responds to changes in load.

b) Please how Hydro Ottawa plans to respond to changes in load in the future.

RESPONSE:

a) Presently, Hydro Ottawa does not play a regular role in matching generation capacity to the need of the loads; rather, electricity generation and demand response activity at the bulk system level is provincially-administered by the IESO. However, in emergency situations, Hydro Ottawa supports the IESO when called upon for load shedding or voltage reduction when generation is insufficient to meet the required loads. Otherwise, Hydro Ottawa builds its grid capacity (i.e. a wires solution) to the forecasted load requirement.

b) At present, Hydro Ottawa is not aware of any viable commercial solution for a distribution utility to respond to rapidly changing load. At the provincial level, demand response, load shedding, and voltage reduction do not address local grid dynamics and they reduce the level of electricity service provided to customers. However, technology is

constantly evolving and Hydro Ottawa believes that it is wholly consistent with its service obligations and mandate to explore promising non-wires alternative solutions. The utility has established the MiGen Program to serve as a platform and structure for such exploration.

INTERROGATORY RESPONSE - EPRF-70

2-EP-41

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. E, pages 431 to 436

SUBJECT AREA: Distribution System Plan

Please file a numerical analysis including cost estimates and a discounted cash flow analysis of the five alternatives that were considered for the Field Area Network that are described on pages 434 and 435. If no such analysis was performed, please explain why not.

RESPONSE:

A detailed analysis in support of a Field Area Network was provided in Hydro Ottawa's previous rate application, as part of the proposed Telecommunications Master Plan.[1] However, as discussed in the project summary on page 431 of Attachment 2-4-3(E): Material Investments in the current Application, the original technology chosen was deemed to be no longer appropriate. Due to the rapidly shifting technology and regulatory landscape, it was decided that a detailed numerical analysis was not yet appropriate. Instead, Hydro Ottawa has chosen to present a budgetary estimate of what the current preferred alternative would cost to implement. Should the implementation project proceed, a full design and detailed costing would be produced.

At the time of writing, Hydro Ottawa continues to actively pursue the second of five alternatives identified in the Material Investment Plan in Attachment 2-4-3(E): Material Investments (page 434). This second alternative contemplates creating or joining a Private Virtual Network Operator or "PVNO," through participation in advocacy in front of the Canadian Radio-Television and Telecommunications Commission ("CRTC").[2] The PVNO model was presented to the CRTC by CEA as part of the consultation on "Review of Mobile Wireless Services" (CRTC 2019-57).

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[1] Hydro Ottawa Limited, *2016-2020 Custom Incentive Rate-setting Distribution Rate Application*, EB-2015-0004 (April 29, 2015).

[2] A key vehicle for advocacy on this matter is Hydro Ottawa's membership in the Canadian Electricity Association ("CEA"). For more information on CEA, please see the association's website: https://electricity.ca/.

INTERROGATORY RESPONSE - EPRF-71

2-EP-42

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. F, Page 8

SUBJECT AREA: Rate Base

Please confirm that according to Hydro Ottawa, the "Optimal Average Age" of a fleet vehicle is 50% of the replacement age.

a) Does keeping the vehicle fleet at the Optimal Average Age ensure that fleet costs are minimized?

b) Is Hydro Ottawa's objective to keep its fleet at the Optimal Average Age? If the answer is yes, how long has that objective been in place? If the answer is no, please explain why not.

RESPONSE:

As a guideline, to help assess the overall age of its fleet assets, the "Optimal Average Age" of a fleet (by category) should be approximately 50% of its replacement age. Monitoring the "Optimal Average Age" provides information and helps in the planning and smoothing of expenditures on vehicle replacements. This monitoring helps avoid a significant wave of aged vehicle replacements in a short period of time. However, it is important to note that "Optimal Average Age" is only a guideline and that there are a number of key factors that are considered when deciding to replace a vehicle.

a) Keeping a vehicle until the "Optimal Average Age" does not ensure that fleet costs are minimized. As illustrated in Figure 1 on page 8 of Attachment 2-4-3(F): Fleet Replacement Program, Hydro Ottawa does not automatically replace vehicles when they

have reached the "Optimal Average Age." A number of key factors are considered prior to vehicle replacement, such as actual vehicle age, number of kilometers driven, engine hours, power take-off hours, vehicle condition, maintenance costs, vehicle utilization, and spare parts availability. In addition, a thorough physical/technical inspection is conducted prior to deciding to replace a vehicle. These factors, taken together, help to ensure that overall fleet costs are minimized.

b) It is not Hydro Ottawa's objective to keep its fleet at the "Optimal Average Age." As mentioned above, "Optimal Average Age" is a guideline and there are a number of key factors to be considered in vehicle replacement and fleet management.

INTERROGATORY RESPONSE - EPRF-72

2-EP-43

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. F, Table 5, Page 9 and Table 8, page 12

SUBJECT AREA: Rate Base

Please explain the apparent decline in cost per Light Duty vehicle between 2022 and 2024.

RESPONSE:

The Fleet purchase projection was based on a per vehicle type basis. There are many vehicle types within the larger light duty category, resulting in a range of prices within the category. The mix of the vehicle types planned to be purchased in the light duty vehicle category changes by year. And in this specific case, in 2022 there are more light duty vehicles in the higher end of the price range, whereas 2024 does not have any vehicles scheduled for replacement in the higher end of the price range.

INTERROGATORY RESPONSE - EPRF-73

2-EP-44

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. F, Page 11

SUBJECT AREA: Rate Base

Preamble:

With respect to the annual trend in expenditures, 2021 has a higher level of capital expenditures on vehicle replacement than average due to the need to urgently replace critical assets. Many of these assets are significantly beyond their expected life and replacement has already been delayed. However, it is no longer possible to delay any further.

Please explain why replacement of assets significantly beyond their expected life was delayed.

Please provide the list of asset replacements and the years that the delay in replacement took place.

RESPONSE:

Hydro Ottawa continually reviews its capital replacement plan to ensure that fleet replacements are made at a level and pace that allows overall costs to be minimized while ensuring safety and reliability. With respect to the 2016-2020 plan, a number of vehicle replacements were deferred in an effort to keep rates affordable, in light of a number of other large General Plant projects such as the Facilities Renewal Program.

With respect to the list of asset replacements and the years that the delay in replacements occurred, please refer to Exhibit 2-4-3: Distribution System Plan, sections 4.3 and 4.4. In each of these sections, there are tables such as Table 10 and Table 13 through which the following

are specified: the vehicle being replaced, the year it was acquired, and how many years the vehicle is beyond its useful life.

INTERROGATORY RESPONSE - EPRF-74

2-EP-45

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. F, Figure 6, Page 23, and Figure 4, Page 24

SUBJECT AREA: Rate Base

Please describe Hydro Ottawa maintenance practices and procedures for the protection of vehicles from corrosion and rust formation.

RESPONSE:

Hydro Ottawa has a fleet wash program where all fleet vehicles are washed weekly during winter months and bi-weekly during summer months. Secondly, every fleet vehicle is ordered with rust inhibiting undercoating applied and light duty vehicles are recoated every two years. Heavy duty vehicles are recoated as problem areas are identified through regular inspections.

INTERROGATORY RESPONSE - EPRF-75

2-EP-46

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Sch. 3, Att. F, Figure 8, Page 26, and Table 19, Page 27

SUBJECT AREA: Rate Base

It appears from the evidence that there is an asset that is 51 years old and 36 years beyond the 15 year replacement criteria but is not scheduled for replacement in the 2021 to 2025 period. What is that asset and why is it not being replaced?

RESPONSE:

This asset is a 1969 Clark electric forklift that is utilized only as a spare forklift and will therefore not be replaced. This forklift is being maintained and inspected as an economical way of having a standby unit in the event that one of the other forklifts is offline for repairs at an inopportune time. All parts are still available for the unit and also interchangeable with the other newer model units.

INTERROGATORY RESPONSE - EPRF-76

2-EP-47

EXHIBIT REFERENCE:

Reference: Exhibit 2, Tab 4, Sch. 3, Att. F, Table 21, Page 29

SUBJECT AREA: Rate Base

Please add a line that shows the ratio of the number of field employees per vehicle.

RESPONSE:

Hydro Ottawa has 247 field/outside staff and 234 Light, Medium, and Heavy Duty Vehicles (excluding trailers, forklifts, etc.). This results in a ratio of 1.06 field staff per vehicle. It should be noted that, in addition to field staff, certain head office-based staff with safety, supervision, and site inspection responsibilities also require the use of vehicles in the Hydro Ottawa fleet. The utility has 387 trained active drivers, resulting in a ratio of 1.65 drivers per vehicle. Hydro Ottawa does not have field staff or driver information for Alectra Utilities or Toronto Hydro, and therefore is unable to calculate a similar ratio for those peer utilities.

Table A below represents an updated version of Table 21 from Attachment 2-4-3(F): Fleet Replacement Program, with the ratio of drivers to vehicles included.

Table A – Comparative Fleet Metrics: Hydro Ottawa vs. Alectra & THESL

Fleet Metrics	Alectra	THESL	Hydro Ottawa
# of Customers per Sq. km. of Service Area	542	1,226	300
% of Vehicles Proposed for Replacement Over Applicable Distribution Rate Period (excluding Other)	51%	54%	49%
# vehicles per 1,000 Customers	1.71	1.58	1.43
# Total Service Area km. served per vehicle	3.16	1.29	4.77
% of Transportation Equipment Depreciated (USofA #1930)	n/a	69%	87%
Ratio of Drivers to Vehicles	n/a	n/a	1.65

INTERROGATORY RESPONSE - EPRF-77

2-EP-48

EXHIBIT REFERENCE:

Reference: Exhibit 2, Tab 4, Sch. 3, Att. F, Page 32

SUBJECT AREA: Rate Base

a) Does Hydro Ottawa track maintenance and repair costs per vehicle? If not, please explain why not.

b) Does Hydro Ottawa use a discounted cash flow repair vs repair financial analysis in its Fleet Management? If not, please explain why not

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RESPONSE:

a) Yes, Hydro Ottawa tracks maintenance and repair costs per vehicle.

b) Hydro Ottawa uses a repair financial analysis approach versus a discounted cash flow repair approach. Prior to deciding on whether it is more economical to repair a vehicle versus replacing it, many factors are considered, such as vehicle age, net book value, ongoing maintenance cost, repair cost, overall reliability of the vehicle, and whether the vehicle continues to meet usage requirements.

INTERROGATORY RESPONSE - EPRF-78

2-EP-49

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. H

SUBJECT AREA: Administration

Preamble: OEB requires that filed documents should be in a searchable/unrestricted PDF format.

a) Why did Ottawa Hydro file this exhibit in a PDF format that does not meet OEB filing requirements that documents be in a searchable/unrestricted PDF format?

b) Please refile this exhibit in a searchable/unrestricted PDF format that meets OEB filing requirements.

RESPONSE:

a) Because the final Distribution Climate Risk and Vulnerability Assessment had been signed electronically by an external party, the original file was locked and unable to be merged within the full application. As a workaround, Hydro Ottawa filed a scanned copy in order to merge it within the main application file.

b) Please find Attachment EPRF-78(A): Unrestricted 2-4-3(H) - Distribution System Climate Risk and Vulnerability Assessment, submitted as a separate file which is searchable/unrestricted.

INTERROGATORY RESPONSE - EPRF-79

2-EP-50

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. H

SUBJECT AREA: Distribution System Plan

a) Did Hydro Ottawa issue an RFP for the production of this report? If the answer is yes, please file the RFP. If the answer is no, please explain why not.

b) Please file the engagement letter that Hydro Ottawa sent to RSI.

c) Please file the Statement of Work for this report.

RESPONSE:

a) Yes, please see attachment EPRF-83(A): RFP 2018-35 - Climate Impact Study.

b) Hydro Ottawa does not have a copy of any engagement letter sent to RSI, as RSI was contracted through Stantec.

c) Please see the response to part (a) above.

INTERROGATORY RESPONSE - EPRF-80

2-EP-51

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. H

SUBJECT AREA: Distribution System Plan

Please file a list of documents and any other information that Hydro Ottawa provided to RSI for the production of this report.

RESPONSE:

Please see the response to interrogatory EPRF-84.

INTERROGATORY RESPONSE - EPRF-81

2-EP-52
EXHIBIT REFERENCE:
Exhibit 2, Tab 3, Sch. 4, Att. H

SUBJECT AREA: Distribution System Plan

a) Please file the CVs of the authors of the report.

b) Is Hydro Ottawa planning to qualify the authors of the report as expert witnesses? If the answer is yes, please file the Acknowledgement of Expert Duty Form "A" for each author. If the answer is no, please explain why not.

RESPONSE:

a) Please see the response to interrogatory EPRF-85.

b) Yes. Expert Duty Form "A"s for Norman Shippe and Guy Félio were filed via the OEB's Regulatory Electronic Submission System on May 28, 2020.

INTERROGATORY RESPONSE - EPRF-82

2-EP-53

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. I

SUBJECT AREA: Administration

Preamble: OEB requires that filed documents should be in a searchable/unrestricted PDF format.

a) Why did Ottawa Hydro file this exhibit in a PDF format that does not meet OEB filing requirements that documents be in a searchable/unrestricted PDF format?

b) Please refile this exhibit in a searchable/unrestricted PDF format that meets OEB filing requirements.

RESPONSE:

a) Because the final Hydro Ottawa Climate Change Adaptation Plan had been signed electronically by an external party, the original file was locked and unable to be merged within the full application. As a workaround, Hydro Ottawa filed a scanned copy in order to merge it within the main application file.

b) Please find Attachment EPRF-82(A): Unrestricted 2-4-3(I) - Hydro Ottawa Climate Change Adaptation Plan, submitted as a separate file which is searchable/unrestricted.

INTERROGATORY RESPONSE - EPRF-83

2-EP-54

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. I

SUBJECT AREA: Distribution System Plan

a) Did Hydro Ottawa issue an RFP for the production of this report? If the answer is yes, please file the RFP. If the answer is no, please explain why not.

b) Please file the engagement letter that Hydro Ottawa sent to Stantec.

c) Please file the Statement of Work for this report.

RESPONSE:

a) Yes, Hydro Ottawa issued an RFP for the production of this report. Please see the following attachments:

- EPRF-83(A): RFP 2018-35 - Climate Impact Study
- EPRF-83(B): RFP 2018-35 - Schedule A
- EPRF-83(C): RFP 2018-35 - Schedule B
- EPRF-83(D): RFP 2018-35 - Schedule C
- EPRF-83(E): RFP 2018-35 - Schedule D
- EPRF-83(F): RFP 2018-35 - Schedule E
- EPRF-83(G): RFP 2018-35 - Schedule F

b) Hydro Ottawa does not send engagement letters; however, a copy of the agreement entered into with Stantec can be found in Attachment EPRF-83(H).

c) The Statement of Work is included in Attachment EPRF-83(B): RFP 2018-35 - Schedule A.

RFP 2018-35
Climate Impact Study
General Terms

SECURITY WARNING

Closing Date and Time:

14 November, 2018

14:00:00 Local Time

Part 1 – Instructions and Conditions

1. Introduction

This document defines the General Terms for RFP 2018-35 Climate Impact Study as outlined in Schedule A – Statement of Work of the RFP. Proponents who submit a Proposal agree to by bound by the instructions and conditions of this RFP.

2. Confidentiality

(1) All documentation and information obtained by the Proponent, the Proponent's business partners, Representatives and other third parties associated with the Proponent in respect of this RFP are the property of Hydro Ottawa, must be treated as confidential and must not be used for any purpose other than for the purpose of responding to this RFP and for the purpose of fulfilling any subsequent contract with Hydro Ottawa. Upon the request of Hydro Ottawa, all such documentation and information, and copies thereof, must be returned to Hydro Ottawa.

(2) Proponents shall not disclose, without Hydro Ottawa's prior written approval, any details pertaining to their Proposal, this RFP and/or the selection process in whole or in part to any business partners, Representatives or other third parties associated with the Proponent in respect of this RFP except to those of them to whom disclosure is necessary in connection with this RFP and who have agreed to be bound by the obligations of confidentiality under this RFP. Proponents shall not issue a news release or other public announcement pertaining to details of their Proposal, this RFP and/or the selection process without Hydro Ottawa's prior written approval.

(3) Each Proponent must ensure that the Proponent, the Proponent's business partners, Representatives, and other third parties associated with the Proponent in respect of this RFP do not disclose or publicize at any time any of the information provided to it by Hydro Ottawa or its representatives, or any of the information obtained in connection with this RFP without the prior written consent of Hydro Ottawa.

(4) Any violation of this provision will result in the rejection of the Proponent's Proposal and disqualification from further participation in this RFP process.

(5) The obligations of confidentiality herein shall survive the conclusion, termination or expiry of this RFP process.

3. Definitions

"Business Days" means the hours from 07:00 to 17:00 Eastern Time, on the weekdays from Monday to Friday inclusive with the exception of statutory holidays observed by the Company.

"Proponent" means the entity or person that submits a Proposal in response to this RFP and may consist of several parties submitting one Proposal as a joint venture, which may be either a contractual joint venture or an equity joint venture.

"Proposal" means any a proposal submitted by a Proponent in response to this RFP.

"Representatives" in reference to party, means the party's directors, officers, employees, agents and Consultants, the party's Affiliates, and all such Affiliates' respective directors, officers, employees, agents and Consultants.

"Services" means the requested services as stipulated in Schedule A - Statement of Work.

4. Examination of Documents

The Proponent shall be held to have ascertained the extent of its obligations by calculating its obligations with reference to the documents concerning this RFP. The Proponent shall not, under any pretense whatsoever, make any claim because of errors or omissions that may exist in the documents and drawings associated with this RFP.

5. Contract Authority

All enquiries and questions regarding this RFP and the completion of a Proposal must be directed to the following Contract Authority before a Proposal is submitted:

Joe Brannen, Senior Procurement Agent
Hydro Ottawa Limited
1970 Merivale Road, Ottawa, ON K2G 6Y9
Telephone: (613) 738-5499 ext. 7143
Email: joebrannen@hydroottawa.com

All questions for clarification must be submitted to the Contract Authority in writing no later than **07 November 2018**. Hydro Ottawa retains the right to refuse to answer any question. Questions that will be answered will be answered to the best of Hydro Ottawa's ability and as quickly as possible. Questions and their answers will be provided to all Proponents who have been invited to submit a Proposal.

6. Preparing the Proposal

(1) The Proponent must comply with all mandatory requirements.

(2) The Proponent must demonstrate its understanding of and its ability to meet the requirements set out in Schedule A.

(3) The Proposal should completely and thoroughly address each element of the requirements as described in this RFP.

7. Proposal Submission

(1) It is the Proponent's responsibility to provide a comprehensive and sufficiently detailed Proposal that includes all the requested details which will permit a complete evaluation in accordance with the rated requirements set out in Schedule D of the RFP.

(2) Timely and correct delivery of Proposals to the specified delivery address is the sole responsibility of the Proponent. All risks and consequences related to the incorrect delivery of Proposals are to be borne by the Proponent.

(3) A contract will not necessarily be awarded to the highest scoring Proposal. A contract may be issued up to ninety (90) days after the Closing Date of the RFP.

(4) The Proposal should completely and thoroughly address each element of the requirement as enumerated in this RFP. It is also essential that the elements contained in the Proposal be stated in a clear and concise manner. Hydro Ottawa will screen out all non-responsive and incomplete Proposals in order to concentrate its effort on acceptable Proposals. "Non-responsive" Proposals are Proposals that do not meet the specified minimum capability within a functional area, and "incomplete" Proposals refer to Proposals that do not include documents in the format described in this RFP.

(5) Proposals received on or before the stipulated Closing Date and time will become the property of Hydro Ottawa and will not be returned. All Proposals will be treated as CONFIDENTIAL.

8. Clarification and Addenda

(1) Proponents shall examine all requests for Proposal documents and shall judge all matters relating to the adequacy and accuracy of such documents. Any inquiries, suggestions or requests concerning clarification, interpretation or additional information shall be made through the contact person as listed in Section 5 of this document.

(2) No oral representation made by any Hydro Ottawa employee, any representative or any other party is to be considered a valid interpretation of this RFP. The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information may be given. If any addenda are issued for this RFP, Hydro Ottawa will attempt to notify all prospective Proponents. However, it shall be the responsibility of each Proponent, prior to submitting their respective Proposal, to contact the above to determine if addenda were issued and to make such addenda a part of the Proposal.

9. Sealed and Marked

Proposals are to be submitted in one sealed package, as instructed in the RFP cover letter, clearly indicating the RFP number to:

PROPOSAL RECEIVING UNIT
Hydro Ottawa Limited
Mailing Address: P.O. Box 8700, Ottawa, Ontario K1G 3S4
Courier Address: 3025 Albion Road North, Ottawa, Ontario K1V 9V9
Attention: Angie Reaney, Supervisor, Procurement

10. Delivery Requirements

Proposals received after the Closing Date and Time will not be given consideration. It shall be the sole responsibility of the Proponent to have their Proposal delivered on or before the Closing Date and Time. If a Proposal is sent by mail, the Proponent shall be responsible for its timely delivery. Proposals not meeting the deadline for acceptance shall not be opened and arrangements shall be made for their return at the Proponent's request and expense.

11. Late Proposals

It is Hydro Ottawa's policy to return, unopened, Proposals delivered after the Closing Date and Time unless they qualify as a delayed Proposal as described below.

12. Delayed Proposals

(1) A Proposal delivered after the Closing Date and time, but before the issue of a contract, may be considered provided the delay can be proven to have been due solely to a delay in delivery that can be attributed to the Canada Post Corporation (CPC) (or national equivalent of a foreign country) or to a courier service. The only pieces of evidence relating to a delay in the CPC system that are acceptable are: a CPC cancellation date stamp; a CPC Priority Courier Bill of Lading; and a CPC Xpresspost Label that clearly indicate that the Offer was sent prior to the RFP Closing Date and that the proper delivery method was chosen, which should have resulted in delivery before the closing date and time. Courier delays may also be considered if the waybill tracking confirms that the proper delivery method was chosen, which should have resulted in delivery before the Closing Date and time.

(2) All other causes for the late delivery of Proposals, including misrouting, traffic volume, weather disturbances, will not be considered acceptable reasons for the Proposal to be accepted by Hydro Ottawa.

13. Legal Name

Proposals shall clearly indicate the complete legal name, address and telephone number of the Proponent. Proponents shall complete Schedule C - Proposal Signature Form. Proposals shall be signed above the typed or printed name and title of the signer. The signer shall have the authority to bind the Proponent to the submitted Proposal.

14. Identity or Legal Capacity of Proponent

In order to establish the legal capacity under which a Proponent proposes to enter into an agreement, any Proponent who carries on business in other than its own personal name shall, if requested by the Contract Authority, provide proof of the legal capacity under which it carries on business to the Contract Authority prior to the award of an agreement. Such proof may be in the form of a copy of the articles of incorporation or of the registration of the business name of a sole proprietor, of a trade name, of a partnership, etc.

15. Proposal Expenses

All expenses for making and submitting Proposals to Hydro Ottawa are to be borne by the Proponent.

16. Revision of Proposals

Changes to Proposals after their submission to Hydro Ottawa are prohibited. However, at any time prior to the Closing Date and Time, and with Hydro Ottawa's consent, a Proponent may amend a Proposal that it has already submitted. A Proponent wishing to amend its Proposal must submit an amended Proposal in the same manner, and within the same deadlines, set out in this RFP. If so required by Hydro Ottawa, the Proponent must request in writing to withdraw its original Proposal.

17. Basis of Payment

Proponents shall quote prices as indicated in **Schedule B – Cost Summary Sheet,** excluding Harmonized Sales Tax (HST), in Canadian Dollars and these shall be submitted with Proposal.

18. Valid Offer

(1) The Proponent may withdraw its Proposal, with Hydro Ottawa's consent, at any time before the Closing Date and Time in accordance with this Section. A request by a Proponent to withdraw its Proposal (a "Request for Withdrawal") must be in writing on the Proponent's letterhead and delivered in person or by e-mail to the Contract Authority. Hydro Ottawa's consent to a Request for Withdrawal shall be at Hydro Ottawa's discretion, and may be reasonably withheld.

(2) If Hydro Ottawa receives more than one Proposal from the same Proponent in respect of this RFP but receives no Request for Withdrawal, the Proposal contained in the envelope bearing the earliest date and time stamp shall be considered the operative Proposal, , except where the Proposal is revised and agreed to as per Section 16.

(3) Any Proposal not withdrawn shall, upon opening, constitute a valid offer for a period of ninety (90) days to sell Hydro Ottawa the goods, services, or both, set forth in the RFP. Hydro Ottawa may request that Proponents extend the

validity period of their Proposals during the Proposal evaluation period. Proponents will have no obligation to extend the validity periods of their Proposal. However, Hydro Ottawa will only continue to consider Proposals that remain valid for acceptance.

19. Mandatory and Rated Requirements

(1) A Proponent shall meet all the mandatory requirements stated in the RFP. The mandatory requirements are indicated by the words “mandatory”, “shall”, “must” or “will”.

(2) Each Proposal will be examined to determine compliance with the mandatory requirements identified in the RFP. A Proposal must comply with **all** of the mandatory requirements in order to proceed in the evaluation process. A Proposal which fails to fulfill one or more mandatory requirements or to make a required submission **will** be eliminated from further consideration. A Proposal which meets all the mandatory requirements will be permitted to proceed in the evaluation process.

(3) Hydro Ottawa will evaluate the responses to this RFP based on criteria/rated requirements set out in Schedule D.

(4) A duly signed and completed Proposal, including the required responses to parts of Schedules B, C, E and F are mandatory.

(5) Where a Proponent’s experience is provided in order to meet the requirements described in this RFP, the Proponent’s experience may include that of the parties to the joint venture, if the Proponent is a joint venture, but shall not include the experience of the Proponent’s Consultants.

(6) The Proponent shall duly sign and complete Schedule C Proposal Signature Form – The Proponent has reviewed Part 2 – General Terms and Conditions and agrees to be bound by same if the Proponent is awarded the contract by Hydro Ottawa. Any request(s) for variance to the General Terms and Conditions must be submitted in writing in advance of the closing date and must be reviewed and/or negotiated by Hydro Ottawa and the Proponent in advance of the closing date. Changes to the General Terms and Conditions, or change requests submitted without adequate notice for Hydro Ottawa to review and respond, may disqualify the Proponent. Proponents shall not attach, or refer to as being part of the proposal, the Proponent’s standard or general or other terms and conditions (T’s &C’s). If the Proponent does attach or refer to the Proponent’s T’s & C’s, the proposal shall be considered non-compliant and shall be disqualified.

20. Reserved Rights

(1) For the purpose of evaluating the Proposals, Hydro Ottawa reserves the right, but is not obligated to do any or all of the following:
   a) to seek clarification or confirmation of any information or data provided by the Proponent;

b) to contact any reference provided by the Proponent; and
c) to interview the Proponent and/or any person proposed by the Proponent to perform the Services.

(2) Hydro Ottawa reserves the right to accept or reject any and/or all Proposals, to waive irregularities and technicalities, to enter into negotiations with the successful Proponent with respect to any or all aspects of their Proposal, to request resubmission; and to cancel and/or re-issue this RFP. Any sole response received may or may not be rejected by Hydro Ottawa depending on available competition and requirements of Hydro Ottawa and Hydro Ottawa reserves the right to enter into an Agreement with the sole responsive Proponent to ensure best value.

(3) Hydro Ottawa also reserves the right to reject a Proposal where, with respect to current or prior transactions with Hydro Ottawa:
a) the Proponent is bankrupt or where, for whatever reason, its activities are rendered inoperable for an extended period;
b) evidence, satisfactory to Hydro Ottawa, of fraud, bribery, fraudulent misrepresentation or failure to comply with any law protecting individuals against any manner of discrimination has been received with respect to the Proponent or any of its Representatives included as part of the Proposal;
c) Hydro Ottawa has exercised its contractual remedies of suspension or termination for default with respect to an agreement with the Proponent or any of its Representatives included as part of the Proposal; and,
d) Hydro Ottawa determines that the Proponent's performance on other agreements with Hydro Ottawa, including the efficiency and workmanship as well as the extent to which the Proponent performed the work in accordance with contractual clauses and conditions, is so poor as to jeopardize the successful completion of the requirement described in this RFP.

(4) There is no obligation on the part of Hydro Ottawa to award an agreement to the lowest-priced Proponent and Hydro Ottawa reserves the right to award a negotiated agreement to the successful Proponent that is most advantageous and in the best interests of Hydro Ottawa. Hydro Ottawa shall be the sole judge of the Proposal and the resulting negotiated agreement that is in its best interest and Hydro Ottawa's decision shall be final. Hydro Ottawa also reserves the right to investigate, as deemed necessary, the ability of any Proponent to perform the Services. The Proponent shall provide information that Hydro Ottawa deems necessary to make this determination. Hydro Ottawa reserves the right to subsequently modify any award based on the Proponent's performance and/or Hydro Ottawa's business needs.

(5) The Proponent agrees that it will neither make a claim against Hydro Ottawa for damages, costs, expected profits or any other loss arising out of Hydro Ottawa's exercise of any right described herein nor seek any recourse of any kind against Hydro Ottawa because of same.

21. Limitation of Liability

Hydro Ottawa does not accept any responsibility for any verbal information or advice or any errors or omissions which may be contained in this RFP or in any documentation, disclosed or otherwise provided by or with this RFP. Neither Hydro Ottawa nor any of its Representatives make any representations or warranties, either express or implied, with respect to the completeness or accuracy of this RFP and supporting documentation or any information or opinion contained herein. Any use or reliance on the RFP or on any information or opinion contained herein or documentation disclosed or otherwise provided by or with this RFP is at the risk of the Proponent and neither Hydro Ottawa nor any of its Representatives shall be liable for any action, cost, loss, damage, injury and/or liability whatsoever incurred by any person arising out of the same. The Proponent is responsible for obtaining its own independent legal, accounting, engineering and other advice with respect to this RFP, any information included in this RFP or any documentation disclosed or otherwise provided by or with this RFP.

22. Proprietary Information

(1) The Proponent agrees that all rights, title and interests, including copyright ownership, to this RFP and all information and material of any kind whatsoever that may be provided to the Proponent by Hydro Ottawa or otherwise obtained by the Proponent relating to this RFP, or in the Proponent's performance of the Services if it is the successful Proponent, shall remain the property of Hydro Ottawa and that all such information and material and any copies thereof shall be returned to Hydro Ottawa upon request. Hydro Ottawa shall obtain all rights, title and interests, including copyright ownership, to the deliverables that are to be produced and delivered to Hydro Ottawa in accordance with this RFP. Hydro Ottawa may disclose, use or modify such deliverables in any manner whatsoever that it deems appropriate. The Proponent shall not do any act that may compromise or diminish Hydro Ottawa's interests as aforesaid.

(2) The Proponent further agrees to maintain all information and material that may be provided to the Proponent by Hydro Ottawa or otherwise obtained by the Proponent in relation to this RFP or in the course of performing the work if the Proponent is the successful Proponent, in strict confidence and to disclose the said information and material only to those of its employees having a need to know same and who have undertaken a like obligation to maintain its confidentiality. The Proponent agrees to not reproduce, not disclose and not distribute the said information and material to any other third party and not to use the said information and material for any purpose other than as specifically contemplated herein, unless Hydro Ottawa's prior written consent to do otherwise is provided.

23. Collusion

By offering a Proposal to this RFP, the Proponent certifies that the Proponent has not divulged, discussed or compared its Proposal with other Proponents and has not colluded with any other Proponent or parties to this RFP whatsoever.

24. Awarding of Agreement

(1) The successful Proponent certifies that it has read Part 2 – General Terms and Conditions of this RFP and has agreed to be bound by the specified terms and conditions. The resulting agreement will consist of the terms and conditions detailed in Part 2. If a request is made to change, or to impose, different terms and conditions by the highest ranked Proponent at the time of agreement execution, Hydro Ottawa reserves the right to terminate any further proceedings with that Proponent and move on to the next highest ranked Proponent, or Hydro Ottawa may choose to terminate the RFP process and not enter into an agreement with any of the Proponents.

(2) Hydro Ottawa shall not be obligated to any Proponent in any manner until a written agreement has been duly executed.

Part 2 - General Terms and Conditions

1. Scope

The Consultant agrees to perform the Services as set out in Schedule A under the general direction and control of Hydro Ottawa, as described in this Agreement. The Consultant shall be solely responsible for the supply of all hardware, software, other technological items or other equipment required to satisfactorily perform the Services.

2. Definitions

In addition to terms defined in the body of these Terms and Conditions and the Schedules thereto, the following terms shall have the meanings set out below:

"Affiliate" means, with respect to any party,

(i) any legal entity of which the securities or other ownership interests representing fifty per cent (50%) or more of the equity or fifty percent (50%) or more of the ordinary voting power or fifty percent (50%) or more of the general partnership interest are, at the time such determination is being made, owned, Controlled or held, directly or indirectly, by such legal entity, or

(ii) any legal entity which, at the time such determination is being made, is Controlling or under common Control with, such legal entity. As used herein, the term "Control", whether used as a noun or verb, refers to the possession, directly or indirectly, of the power to direct, or cause the direction of, the management or policies of a legal entity, whether through the ownership of voting securities, by contract or otherwise.

"Agreement" means this written contract resulting from the RFP and executed between Hydro Ottawa and the Consultant.

"Applicable Law" means any domestic or foreign law, rule, statute, subordinate legislation, regulation, by-law, order, ordinance, protocol, code, guideline, treaty, policy, notice, direction or judicial, arbitral, administrative, ministerial or departmental judgment, award, decree, treaty, directive, or other requirement or guideline published or in force at any time during the Term which applies to or is otherwise intended to govern or regulate any Person, property, transaction, activity, event or other matter, including any rule, order, judgment, directive or other requirement or guideline issued by any Government Authority.

"Business Day(s)" means the hours from 07:00 to 16:30:00, Eastern Time, on the weekdays from Monday to Friday, inclusive, with the exception of statutory holidays observed by Hydro Ottawa.

"Claim" means any actual, or threatened civil, criminal, administrative, regulatory, or arbitral demand, action, suit, investigation or proceeding or any other claim or demand.

"Consultant" means party in contract with Hydro Ottawa or the duly authorized representative. This shall include the Consultant, its officers, directors, employees, agents, assigns, and subcontractors.

"Effective Date" shall mean the date the second party executes this Agreement.

"Governmental Authority" means any government, parliament, legislature or any regulatory authority, agency, commission or a board of any government, parliament or legislature, or any political subdivision thereof, or any court or, without limitation to the foregoing, any other law, regulation or rule making entity or any person acting under the authority of any of the foregoing or any other authority charged with the administration or enforcement of laws.

"Hydro Ottawa" and "HOL" mean Hydro Ottawa Limited.

"Intellectual Property" means:

(a) any and all proprietary rights anywhere in the world provided under:
    (i) patent law;
    (ii) copyright law (including moral rights);
    (iii) trade-mark law;
    (iv) design patent or industrial design law;
    (v) semi-conductor chip or mask work or integrated circuit topography law; or any other statutory provision or common law principle applicable to this Agreement, including trade secret law, that may provide a right in either hardware, software, content, documentation, confidential information, trade-marks, ideas, formulae, algorithms, concepts, inventions, processes or know-how generally, or the expression or use of such hardware, software, content, documentation, confidential information, trade-marks, ideas, formulae, algorithms, concepts, inventions, processes or know-how;
(b) any and all applications, registrations, licences, sub-licences, franchises, agreements or any other evidence of a right in any of the foregoing; and
(c) any and all licences and waivers and benefits of waivers of the intellectual property rights set out in paragraphs (a) or b) above, all future income and proceeds from the intellectual property rights set out in paragraphs (a) or (b) above, and all rights to damages and profits by reason of the infringement or violation of any of the intellectual property rights set out in paragraphs (a) or (b) above.

"Losses" means:

(a) any and all damages, Claims, fines, penalties, deficiencies, losses, liabilities (including settlements and judgments) in a monetary settlement or finally awarded by a court, arbitration panel or other adjudicative or quasi-adjudicative panel, having competent jurisdiction, and
(b) related and reasonable costs and expenses (including interest, court costs, reasonable fees and expenses of lawyers, accountants and other

experts and professionals or other reasonable fees and expenses of litigation or other proceedings or of any Claim, default or assessment).

"OHSA" means the Occupational Health and Safety Act, R.S. 0. 1990, c. 0.1, as amended or replaced from time to time.

“Person” means any individual, partnership, franchise holder, association, corporation or any Government Authority and their respective employees, agents or representatives.

“Personnel” means the Consultant’s employees, agents, Consultants, and subcontractors

“Personal Information” means information about an identifiable individual, including without limitation any information defined or deemed as such pursuant to any Applicable Laws or regulations related to privacy or data protection.

“Representatives” in reference to party, means the party’s directors, officers, employees, agents, subcontractors, and suppliers, the party’s Affiliates, and all such Affiliates’ respective directors, officers, employees, agents and suppliers.

“Services” means the requested services set out in Schedule A.

3. Priority of Documents

The documents specified below form part of and are incorporated into this Agreement. If there is a discrepancy between the wording of these Terms and Conditions and the wording of any document which appears on the list, the wording of these Terms and Conditions shall prevail. If there is a discrepancy between the wording of any documents which appear on the list, the wording of the document which first appears on the list shall prevail over the wording of any document which subsequently appears on the list:

(a) These General Terms and Conditions
(b) Schedule A - Statement of Work
(c) Schedule B - Cost Summary Sheet

4. Contract Authority

The Contract Authority is:

Joe Brannen, Senior Procurement Agent, Hydro Ottawa
1970 Merivale Road,
Ottawa, ON K2G 6Y9

Telephone: (613) 738-5499 ext. 7143
Email: joebrannen@hydroottawa.com

The Contract Authority is responsible for the management of this Agreement. Only changes to this Agreement that are authorized in writing by the Contract Authority are binding on Hydro Ottawa. The Consultant shall not perform services outside the scope of the Services without the written authorization of the Contract Authority.

5. Project Manager

Project Manager is:

Jenna Gillis, Manager - Asset Planning, Hydro Ottawa
1970 Merivale Road
Ottawa, ON K2G 6Y9

Telephone: (613) 738-5499 ext. 7302
Email: jennagillis@hydroottawa.com

The Project Manager is responsible for all matters concerning the technical content of the Services under this Agreement. Any proposed changes to the scope of the Services must be discussed with the Project Manager, but only the Contract Authority has the authority to amend this Agreement.

6. Consultant's Contact

The Consultant's Contact is:

[*Name*]
[*Address*]

Telephone:
Email:

7. Compliance with Applicable Laws

(1) The Consultant shall, at its sole expense, obtain and maintain all permits, licenses and approvals required by Applicable Law or Governmental Authority to conduct its business generally and to perform its duties under this Agreement and to undertake and complete the Services. The Consultant and its Representatives shall comply with all Applicable Law, in undertaking and completing the Services

(2) Where there is a conflict between any provisions of the above-mentioned authorities, the most stringent provision will govern.

8. Term

Subject to the termination rights contained in this Agreement, this Agreement shall commence on the effective date and shall terminate on August 31, 2019 (the "Term").

9. Termination and Default

(1) Each of the following will constitute an Event of Default by the Consultant:

(a) The Consultant becomes insolvent, makes a general assignment for the benefit of creditors, permits a Receiver to be appointed for its business or assets or becomes subject to any proceedings under the Bankruptcy *and Insolvency* Act or any statute of any provinces, state or other jurisdiction relating to insolvency or the protection of creditor's rights.

(b) The Consultant fails to perform any material covenant or obligation set forth in this Agreement (except to the extent constituting a separate Event of Default) if such failure is not remedied within ten (10) Business Days after written notice of such failure from Hydro Ottawa.

(c) Any representation made by the Consultant is not materially true or correct in any material respect when made and is not made materially true or correct within two (2) Business Days after receipt by the Consultant of written notice of such fact from Hydro Ottawa.

(d) The Consultant fails to conform to all Applicable Law.

(e) The Consultant has breached or is in breach of Section 21.

(2) If any Event of Default occurs, upon written notice to the Consultant, Hydro Ottawa may terminate this Agreement.

(3) Despite the foregoing, upon the occurrence of an Event of Default referred to in paragraph 1(a), this Agreement shall automatically terminate without notice, act or formality, effective immediately before the occurrence of such Event of Default.

(4) Any termination shall be without prejudice to the rights accruing and remedies subsisting under this Agreement at the date of such termination. In addition, Hydro Ottawa shall be entitled to obtain damages from the Consultant for any losses incurred directly resulting from such Event of Default. Furthermore, in addition to its rights of set-off available to it under this Agreement or at law, Hydro Ottawa may hold back payment or set-off its obligation to make such payment against any payments owed to it if the Consultant fails to comply with its obligations on termination.

(5) Notwithstanding anything to the contrary contained herein, Hydro Ottawa may, at any time prior to the completion of the Services, terminate the Agreement as regards all or any part of the uncompleted services, by giving written notice to the Consultant. Upon receipt of a termination notice, the Consultant shall cease work in accordance with the notice, but shall proceed to complete such part or parts of the Services that are not affected by the termination notice.

(6) In the event of a termination notice being given pursuant to this Section the Consultant shall be entitled to be paid, to the extent that costs have been reasonably and properly incurred for the purposes of performing the Agreement

and to the extent that the Consultant has not already been so paid or reimbursed by Hydro Ottawa, on the basis of the pricing set out in the Agreement, for all work completed, inspected and accepted in accordance with the Agreement.

(7) Notwithstanding Section 10, if an event of force majeure continues for 30 days or more, Hydro Ottawa, in its absolute discretion, may terminate this Agreement. In such case, the parties agree that neither will make a claim against the other for damages, costs, expected profits or any other loss arising out of the termination or the event that gave rise to the force majeure.

(8) Upon termination, whether pursuant to this Section or the expiry of the Agreement, at Hydro Ottawa's request the Consultant shall provide a copy of all Hydro Ottawa's records in the format acceptable and indexing to Hydro Ottawa without any delay.

10. Force Majeure

(1) Neither party shall be liable in damages or have the right to terminate this Agreement for any delay or default in performing hereunder if such delay or default is caused by conditions beyond the party's control including, but not limited to Acts of God, Government restrictions (including the denial or cancellation of any permits or other necessary license), wars, insurrections, fires, floods or unusually severe weather, disruptions resulting from labour disputes, governmental or regulatory action and/or any other cause beyond the reasonable control of the party whose performance is affected.

(2) The delivery requirements specified in the Agreement and affected by such causes shall be extended by periods equal to the duration of the event that gave rise to the force majeure. The Consultant shall immediately notify Hydro Ottawa of any event or situation that might possibly create a situation of force majeure. Acknowledgement of any force majeure is subject to the submission by the Consultant of a written confirmation of proof of the events or circumstances forming the basis of the Consultant's claim regarding force majeure.

11. Representations and Warranty

The Consultant covenants and agrees with and represents and warrants to Hydro Ottawa as follows and covenants and agrees that such representations and warranties shall remain true and correct throughout the Term of this Agreement:

a) Status. The Consultant is duly constituted, validly existing and in good standing under the laws of its governing jurisdiction;

b) Authority. The Consultant has the necessary power, authority and capacity and good and sufficient right to enter into this Agreement on the terms and conditions herein set forth, and the execution and performance of this Agreement will not conflict with, or constitute a breach under, any agreement to which it is a party or any judgment, order, statute or regulation which is applicable to it;

c) Conflict of Interest. The Consultant warrants that it presently has no interest and will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the lawful and ethical performance of the Services under this Agreement;

d) Experience and Financial Capacity. The Consultant has the experience, ability and financial capacity to perform and fulfill its obligations hereunder, and covenants to maintain during the Term, the financial and other ability and authority to perform and fulfill its obligations hereunder;

e) Care and Skill. The Services rendered hereunder are in compliance with Schedule A and shall be performed to that degree of care and skill as is normally performed in the industry in the provision of Services of a similar nature on projects of comparable scope and complexity;

f) Certifications and Qualifications. The Consultant has obtained, at its expense, the necessary valid and current certifications and qualifications that are normally required pursuant to Applicable Laws, if any, and in the industry for the provision of the Services;

g) Valid, Binding and Enforceable. This Agreement constitutes a valid and binding obligation of the Consultant, enforceable against it in accordance with its terms and conditions; and

h) HST Registrant. The Consultant is an “HST Registrant” in good standing; and the Consultant is not a non-resident of Canada within the meaning of the Income Tax Act (Canada), as amended.

12. Intellectual Property

(1) The Consultant retains ownership of its proprietary information and methodologies, which include, but are not limited to, its computer models, analytical approaches, know-how, methods, techniques, processes and skills, and adaptations thereof. Upon completion of the Agreement or in the event of Agreement termination, Hydro Ottawa owns all final appraisals resulting from the Services, subject to the terms of use.

(2) The Consultant warrants that any concepts, products and processes developed by the Consultant under this Agreement will not infringe the patent, trademark, copyright, industrial or other intellectual property rights of another person. The Consultant shall pay the royalties and patent licence fees required for the performance of the Services. The Consultant shall hold Hydro Ottawa harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Consultant’s performance of the Services which are attributable to an infringement or an alleged infringement of a patent of invention by the Consultant or anyone for whose acts the Consultant may be liable. If any concept, product or process becomes, or in the Consultant’s opinion is likely to become, the subject of an infringement claim, the Consultant shall, at its option and expense, either: (a) procure for Hydro Ottawa the right to continue using the concept, product or process; (b) replace or modify the concept, product

or process so that it becomes non-infringing and is substantially equivalent to that which is being replaced or modified; or (c) give Hydro Ottawa a full refund for all fees paid by the Consultant in relation to said concept, product or process.

(3) Hydro Ottawa shall hold the Consultant harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Consultant's performance of the Services which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the Agreement, which was supplied to the Consultant by Hydro Ottawa as part of the Services.

13. Indemnification

(1) The Consultant shall indemnify, defend, and save harmless Hydro Ottawa, together with Hydro Ottawa's Representatives and assigns, from and against any and all loss, damage, injury, or safety infraction of the Consultant, or its Representatives, under all conditions and all actions, causes of action, proceedings, suits, claims, demands, losses, damages, penalties, costs (including the payment of all legal fees), expenses, obligations and liabilities in connection therewith, attributable to, related to or arising out of:

(a) breaches of the Consultant's, or its Representatives', obligations herein,
(b) any misrepresentation, inaccuracy, incorrectness or breach of any representation or warranty made by the Consultant contained in this Agreement and/or
(c) any of the Consultant's, its Representatives' or transferees', acts or omissions, which constitute negligence, willful misconduct or fraud
(d) breach of Applicable Law by Consultant,
(e) bodily injury, death, or damage, loss or destruction of tangible property caused by the negligence of Consultant.

(2) Hydro Ottawa shall give notice to the Consultant of any claim, action, suit or proceeding referred to in subsection 13(1) and the Consultant shall at its own expense, to the extent requested by Hydro Ottawa, participate in or conduct the defence of any such claim, action, suit or proceeding and any negotiations for settlement of the same, but the Consultant shall not be liable to indemnify Hydro Ottawa for payment of any settlement unless it has consented to the settlement.

(3) Unless prohibited by law, Hydro Ottawa shall indemnify and hold harmless Consultant and its affiliates, including each of their respective employees, from and against any and all liabilities, losses, costs, and reasonable expenses, including but not limited to, reasonable legal fees and expenses and billable hours of client service personnel, which are i) incurred in responding to court orders, discovery, or other similar inquiries associated with or arising from the engagement or ii) arising from or relating to third-party claims based on reliance or purported reliance on Consultant's work product or other alleged loss or damage caused to or alleged by any non-client entity arising from unauthorized access to or reliance upon Consultant's work product. The foregoing indemnification obligations shall not apply in the event that a court of competent

jurisdiction finally determines that such claims resulted directly from the negligence, willful misconduct, or fraudulent acts of Consultant.

(4) Hydro Ottawa may elect to participate in or conduct the defence of any such claim, action, suit or proceeding by notifying the Consultant in writing of such election without prejudice to any other rights or remedies of Hydro Ottawa under this Agreement, at law or in equity. Each party participating in the defence shall do so by actively participating with the other's counsel. If the Consultant is requested by Hydro Ottawa to participate in or conduct the defence of any such claim, action, suit or proceeding, Hydro Ottawa agrees to co-operate with and assist the Consultant to the fullest extent possible in the claim, action, suit or proceeding and any related settlement negotiations. If Hydro Ottawa conducts the defence of any such claim, action, suit or proceeding, the Consultant agrees to co-operate with and assist Hydro Ottawa to the fullest extent possible in the claim, action, suit or proceeding and any related settlement negotiations.

14. Insurance

(1) Before commencing any Services under this Agreement, the Consultant shall provide its liability insurance certificate on an Acord form issued by the broker attesting its coverage by a Commercial General Liability Insurance Policy. Hydro Ottawa and its Affiliates must be named as an additional insured by general endorsement on the Consultant's policy. The coverage shall be one million dollars ($1,000,000) for each occurrence involving bodily injury or property damage. Such coverage must be maintained continuously during the course of the work under the Agreement, and renewal certificates must be provided as required.

(2) The Consultant shall carry Third Party Automobile Liability Insurance Policy, with a minimum limit of 0ne million dollars ($1,000,000) per Occurrence.

(3) The Consultant shall maintain Professional Liability insurance coverage (minimum $1,000,000 per claim) throughout the Term of the Agreement, and for a period of three (3) years after the date of contract completion.

(4) Failure by the Consultant to ensure that the required insurance coverage remain in force during the course of the Agreement will result in the immediate termination of the Agreement without notice and without penalty to Hydro Ottawa.

(5) The Consultant shall maintain Workplace Safety and Insurance Board ("WSIB") coverage at all times during the performance of the Services and during the term of this Agreement for the Services, and shall ensure that any Subcontractor of the Consultant maintain WSIB coverage at all times during their performance of the Services. The Consultant shall provide a WSIB Clearance Certificate indicating that premiums are paid up to date. Failure to maintain up to date WSIB premiums, may result in the immediate termination of this Agreement without penalty to Hydro Ottawa.

15. Subcontracting

(1) In providing the Services contracted for under this Agreement, the Consultant shall act as a single point-of-accountability vendor and shall assume complete and overall contractual responsibility for the provision of the Services and related activities and provide for all ongoing product and performance warranties to the extent set out in this Agreement. The provision of any products or services by any of the Consultant's subcontractors shall not in any way whatsoever release or discharge the Consultant or derogate from the covenants, representations and warranties provided by the Consultant under this Agreement. Notwithstanding the provision of products or services by any subcontractors, the sole responsibility for the provision of all products or services during the Term lies with the Consultant and in no event shall Hydro Ottawa be compelled to seek or pursue remedy against any of the Consultant's subcontractors.

(2) The Consultant shall not subcontract or assign the whole or any part of the Agreement without the prior written consent of Hydro Ottawa. Such consent shall be in the sole discretion of Hydro Ottawa and subject to the terms and conditions that may be imposed by Hydro Ottawa. Without limiting the generality of the conditions which Hydro Ottawa may require prior to consenting to the Consultant's use of a subcontractor, every contract entered into by the Consultant with a subcontractor shall adopt all of the terms and conditions of this Agreement as far as applicable to those parts of the Services provided by the subcontractor. Nothing contained in the Agreement shall create a contractual relationship between any subcontractor or the subcontractor's Representatives and Hydro Ottawa.

(3) In performing this Agreement, the Consultant shall operate as an independent Consultant, maintaining its own organization as a distinct and separate legal entity from Hydro Ottawa. The Consultant and the Consultant's Representatives shall have no authority to hold themselves out as acting on behalf of or to legally bind Hydro Ottawa. Nothing in this Agreement shall be deemed to constitute a partnership or a joint venture or to create any fiduciary relationship between Hydro Ottawa and the Consultant.

16. Personnel

(1) The Consultant shall employ, and continue to employ throughout the Term, Personnel with the qualifications and business experience necessary to competently undertake and complete the Services pursuant to this Contract.

(2) The Consultant shall provide the services of the resources specified in the Consultant's Proposal dated [*Date*], namely [*Name(s)*] to perform the Services unless it is impossible to do so for reasons which are beyond its control. In such case, the Consultant shall be responsible for providing replacement(s) that shall be of equal or superior ability and attainment.

(3) In no event shall the Consultant allow replacement personnel perform any of the Services until the Consultant has obtained the approval of Hydro Ottawa in accordance with subsection (4).

(4) Prior to replacing personnel, the Consultant shall give written notice to Hydro Ottawa no later than ten (10) business days before the date the proposed replacement is to take effect. The notice shall include the reason for the replacement; and the name, qualifications and experience of the proposed replacement.

(5) The Consultant shall maintain comprehensive policies to ensure a safe work environment. More specifically, the Consultant shall conduct background screening (including, but not limited to, criminal records, employment records, education history, financial and security checks) of its Personnel. When requested by Hydro Ottawa, the Consultant shall provide to Hydro Ottawa criminal background checks acceptable to Hydro Ottawa for all Personnel who will be entering or will have access to Hydro Ottawa premises pursuant to this Agreement.

17. Invoices

(1) Invoices must be submitted in the name of the Consultant and are not to be submitted prior to the performance of the Services. They must show the name and address of the Consultant, together with date, reference to purchase order number, amount charged for services performed during the period, additional charges if applicable, applicable taxes, and description of services provided.

(2) The preferred method of receiving invoices is via e-mail addressed to the Accounts Payable Department at accountspayable@hydroottawa.com. Invoices can also be mailed to the Accounts Payable Department at Hydro Ottawa's office at 3025 Albion Road North, P.O. Box 8700, Ottawa, Ontario, K1G 3S4.

18. Payment

(1) The Consultant's pricing information is contained in Schedule B. Payment shall be based as rates in Schedule B, excluding taxes, and, subject to subsections 18 (2), (3), and (4).

(2) Payment will only be made if a duly completed invoice and any other documents required by the Agreement have been submitted, and verified by Hydro Ottawa, in accordance with the terms of the Agreement.

(3) Hydro Ottawa shall notify the Consultant, within five (5) Business Days of receipt of an invoice or revised invoice, of any inadequacy of the invoice or of the supporting documentation, and where any such notice is given within that period, the date for payment of the amount invoiced shall be postponed until the Consultant remedies the inadequacy to the satisfaction of Hydro Ottawa.

(4) Subject to subsection 18(3), payment will be made within 30 (thirty) days following the date of receipt of a duly completed invoice, in accordance with Section 17.

19. Acceptance

No part of the Services will be accepted unless approved by Hydro Ottawa and Hydro Ottawa is satisfied that the work completed fully complies with the true meaning and intent of the specifications set out in Schedule A - Statement of Work, as confirmed by and through Hydro Ottawa's review of each draft appraisal report. Such acceptance, however, shall not impair any claim that Hydro Ottawa may have for the replacement of defective work or material.

20. Records and Audit

(1) The Consultant shall keep proper accounts and records of the cost to the Consultant of the Services provided and of all expenditures or commitments made by the Consultant in connection therewith, and shall keep all books and records including invoices, receipts, vouchers, cheques, and bank statements relating thereto. The Consultant shall not, without the prior written consent of Hydro Ottawa, dispose of any such accounts, records, invoices, receipts or vouchers until the expiration of seven (7) years after final payment under this Agreement, or until the settlement of all outstanding claims and disputes, whichever is later.

(2) All such accounts and records as well as any invoices, receipts, vouchers, cheques, and bank statements shall at all times during the retention period referred to in subsection 20 (1) be open to audit, inspection and examination by the authorized representatives of Hydro Ottawa, who may make copies and take extracts thereof. Consultant shall furnish all such information as the representatives of Hydro Ottawa may from time to time require with respect to such accounts, records, invoices, receipts and vouchers.

21. Confidentiality

(1) Each party agrees to
   (a) keep confidential all Confidential Information disclosed to by the other party during the Term of this Agreement and
   (b) not disclose any of such Confidential Information to any third party or any of the third party's Representatives except to such of them to whom disclosure is necessary in connection with this Agreement and who have agreed to be bound by the obligations of confidentiality under this Agreement.

"Confidential Information" means any proprietary ideas, plans and information, including without limitation, information of a technical or business nature (including without limitation, all trade-secrets, technology, financial information, intellectual property, any information relating to human resources matters, data, summaries, reports, the terms of this Agreement, or customer lists, whether oral or written and if written, however produced or reproduced) of a party or any of the party's Affiliates that is received by or otherwise disclosed by one party to the other party that is marked proprietary or confidential, or that would logically be considered proprietary or confidential under the circumstances of its disclosure. In addition, no party shall directly or indirectly use to the party's own advantage any such Confidential Information. If this Agreement is terminated at any time, the parties agree that such Confidential Information provided and all copies thereof (excluding Confidential

Information in oral form that has not been put into tangible form) will be immediately returned to the disclosing party or, at the disclosing party's option, destroyed. Notwithstanding the foregoing, the receiving party shall be entitled to keep, subject always to all the provisions of this Agreement, one copy of any notes, analyses, reports or other written material prepared by, or on behalf of, the receiving party that contain Confidential Information for the receiving party's records. In the event of any destruction of Confidential Information as set forth above, the receiving party shall provide to the disclosing party, upon request, a certificate of one of the party's senior officers certifying such destruction.

(2) The Consultant shall:
   (a) collect, use, disclose, and retain Personal Information only as required to fulfil its obligations pursuant to this Agreement;
   (b) take appropriate measures to ensure the privacy and security of all Personal Information, including taking measures to prevent unauthorized access, collection, use, disclosure, copying, modification or disposal; and
   (c) comply with all applicable laws or regulations related to privacy or data protection.

(3) Confidential Information shall not include information that:
   (a) is already known to the recipient at the time of disclosure;
   (b) is or becomes publicly known otherwise than by a breach of this Agreement by the receiving party or the receiving party's Representatives or any third person to whom the receiving party discloses such Confidential Information;
   (c) is communicated to a third party with the express written consent of the disclosing party;
   (d) is independently developed by the recipient without the benefit of having received said confidential information;
   (e) is lawfully required to be disclosed, provided that, prior to making such disclosure, to the extent permitted by law, the recipient shall immediately give the disclosing party written notice and cooperate with the disclosing party in applying for an order to prohibit or restrict such disclosure and/or to assure confidential handling of such Confidential Information and the disclosing party shall be responsible for the recipient party's out-of-pocket expenses, including legal fees, and personnel time incurred in responding to such order to prohibit or restrict such disclosure.

(4) Each party shall be responsible for any breach of this Agreement by the party, the party's affiliates, Representatives and any person to whom the party discloses any Confidential Information. Full and faithful performance by each of the parties hereto of all obligations under this Agreement is the essence of this Agreement. Each of the parties hereto acknowledges that monetary damages are not an adequate remedy for violations of the obligations of confidentiality under this Agreement and that any non-compliance or breach thereof shall result in irreparable harm to the disclosing party, and that in such event the disclosing party shall be entitled to equitable relief, including injunctive relief, without prejudice to any other remedies available to the said disclosing party.

(5) The obligations of confidentiality herein shall survive the termination or expiry of this Agreement.

22. Dispute Resolution

Any disagreement or dispute ("Dispute") between the Parties with respect to the performance of the Services under this Agreement or the interpretation of any provision of this Agreement shall be resolved in accordance with the following procedure:

(a) The Parties agree that every effort shall be made to resolve all Disputes at the Project Manager level of either Party.

(b) If the Project Managers are unable to resolve the Dispute within three (3) Business Days, then the Dispute shall be referred to, in the case of Consultant, the President and CFO, and in the case of Hydro Ottawa, the Manager , Asset Planning (the "Executive Representatives"). The Executive Representatives shall make all reasonable efforts to resolve the Dispute within two (2) Business Days of its referral by the Project Managers.

(c) If the Executive Representatives are unable to resolve the Dispute within the time period defined in 22 (b), then either one of them can refer the Dispute to a court located in Ottawa, Ontario.

23. Notices

Any notice required to be given shall be in writing and shall be delivered by hand to the party for which it is intended or sent by electronic mail, prepaid registered mail or prepaid courier directed to such party at the address indicated below, or such other address as any party may stipulate by notice to the other. Any notice delivered by hand or prepaid mail or courier shall be deemed to be received on the date of actual delivery thereof. Any notice delivered by electronic mail shall be deemed to be received on the next day following the date the electronic mail was sent.

Hydro Ottawa Limited

1970 Merivale Road
Ottawa, ON K2G 6Y9

Attention: Ms. Jenna Gillis, Manager - Asset Planning
Email: jennagillis@hydroottawa.com

[*Consultant*]

[*Name*]

[*Address*]

Telephone:
Email:

24. Successors and Assigns

(1) This Agreement shall enure to the benefit of and be binding upon the parties thereto, and except as otherwise provided therein, upon the executors, administrators, successors, and permitted assigns.

(2) Notwithstanding subsection 24 (1), the Consultant shall not assign its rights under this Agreement, in whole or in part, without the prior written consent of Hydro Ottawa. Hydro Ottawa may apply terms and conditions in respect of such consent.

(3) Hydro Ottawa may assign its rights under this Agreement, in whole or in part, without the prior written consent of the Consultant.

25. Performance

The Services shall be performed in accordance with the approved industrial practices and carried out by technicians or workers skilled and qualified in the type of services required. The Consultant shall conduct itself with the utmost professionalism to ensure good working relations.

If the Consultant is delayed in the performance of the Services by an action or omission of Hydro Ottawa, Hydro Ottawa shall extend the Timelines in Schedule A for such reasonable time as Hydro Ottawa may determine.

26. Time of Essence

Time shall be of the essence of this Agreement.

27. Conflict of Interest

The Consultant warrants that it presently has no interest and will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of the Services under this Agreement.

28. Entire Agreement

The terms and conditions set forth in this Agreement constitute the full and final expression of the contract in respect of the Services, and all matters contemplated in this Agreement, and supersedes all prior quotations, purchase orders, correspondence or communications whether written or oral between the Consultant and Hydro Ottawa. Notwithstanding any contrary language in the Consultant's purchase order, correspondence or other form of acknowledgement, the Consultant shall be bound by this Agreement. ANY ADDITIONAL OR ANY DIFFERENT TERMS ARE REJECTED UNLESS EXPRESSLY AGREED TO IN WRITING BY BOTH HYDRO OTTAWA AND THE CONSULTANT.

29. Amendments and Waivers

No amendment or waiver of any provision of this Agreement shall be binding on either party unless agreed to in writing by such party. No waiver of any provision of this Agreement shall constitute a waiver of any other provision, nor shall any waiver constitute a continuing waiver, unless otherwise provided.

30. Survival

Any terms, which by their nature are intended to survive the termination of this Agreement, shall continue in full force and effect after termination, which terms shall include, but not be limited to Sections 11, 13, 14, 15, 20 & 21.

31. Service Related Terms

Notwithstanding anything to the contrary here or in the Agreement, the following terms will apply to the property insurance appraisal services as set forth in Schedule A provided by Consultant:

Limited Use and Reliance – Hydro Ottawa is the sole intended user of Consultant's report or other work product. Hydro Ottawa may disclose an informational copy of the report or other work product to its audit, tax, legal or insurance professionals acting in an advisory capacity in connection with the purpose of this engagement. Hydro Ottawa shall not reference Consultant or its work in any public filing or other materials distributed to actual or prospective shareholders, investors, financing parties, or similar third parties without Consultant's prior written consent. No third party shall have the right of reliance on the report, and neither receipt nor possession of the report by any third party shall create any express or implied third-party beneficiary rights.

Engagement Limits – Consultant's report may only be used for the specific purpose or premise of value stated in this Agreement and the report. Consultant's work product is intended to assist Hydro Ottawa in making informed business decisions; it is not a recommendation. Any decisions relating to insurance coverage shall remain Hydro Ottawa's responsibility and be made solely at its discretion.

Information Provided by Client – Consultant will not independently verify information provided by Hydro Ottawa, its advisors, or third parties acting at Hydro Ottawa's direction. Consultant will assume and rely on the accuracy and completeness of all such information.

Limitation of Liability – In no event shall Consultant be liable to Hydro Ottawa (or any person claiming through Hydro Ottawa) under this Agreement, under any legal theory, for any amount in excess of the total professional fees payable by Hydro Ottawa to Consultant in connection with this engagement, except to the extent such liability is directly caused by Consultant's negligence, fraud, or willful misconduct. The foregoing limitation of liability shall not apply to liabilities that arise from personal injury or property damage resulting primarily from Consultant's negligence or willful misconduct. In no event shall Consultant be liable to Hydro Ottawa for any

consequential, indirect, lost profit, or similar damages relating to or arising from this engagement.

Environmental Policy – Consultant will not investigate, nor assume responsibility for, the existence or impact of any contamination or hazardous substance related to property or assets associated with this engagement.

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SCHEDULE A - STATEMENT of WORK

Background

Hydro Ottawa constantly looks at opportunities and threats to its electrical distribution assets to ensure they are able to continue to deliver value throughout their lifecycle. In order to improve upon existing asset management practices, Hydro Ottawa is looking to undertake a distribution system climate vulnerability risk assessment and develop a Climate Change Adaptation Plan. This assessment should generally follow the guidelines set in the Canadian Electricity Association's guide "Adapting to Climate Change, A Risk Management Guide for Utilities" and implement a recognized protocol, such as the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Engineering Protocol. This work will help drive continuous improvement to Hydro Ottawa's Asset Management System.

Key Deliverables

Part 1

Deliverable should be contained within a formal report along with a summary presentation (delivery and slide deck) of key findings.

- Overview of how the impacts of climate change are likely to affect Hydro Ottawa's electrical distribution system.
- Outline the need for, and processes by which Hydro Ottawa can continue efforts to better understand its risks, take proactive steps to manage the risks and enhance the resilience of its electrical distribution system to climate change
    - Identification of risk categories and/ or asset management objectives that should be added/adapted under our Strategic Asset Management Plan
- Local Climate
    - Information on present and future climate specific to Hydro Ottawa's service territory (City of Ottawa & Village of Casselman) using a probabilistic approach
- Weather Effects on Hydro Ottawa Electrical System Performance
    - Reliability
    - Worker Safety (working during storm conditions to restore power)
    - Impact and Risk on various asset classes
        - Overhead system
        - Underground system
        - Substations
        - Metering
    - Analysis of 3 high impact storm events in Ottawa, including weather and impact on the asset failures in context with forecasted future weather patterns
        - April 16th, 2018
        - May 4th, 2018
        - September 21st, 2018
- Summary of analysis including an overview of critical areas of focus and priorities for development of an Adaptation Plan

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SCHEDULE A - STATEMENT of WORK

Part 2

Deliverable should be contained within a formal report along with a summary presentation (delivery and slide deck) of key findings and recommendations.

- Develop an Adaptation Plan, following a recognized protocol for climate impact assessment, to improve the resilience of Hydro Ottawa's electrical system.
    - Enhancing understanding of the projected changes in extreme weather event frequencies and intensities
    - Detailing links between the climate and future vulnerabilities' impact on system reliability
    - Projecting impact of climate change on the number of customer service interruptions and quantifying through reliability measures
    - Identifying areas for priority intervention
    - Identifying adaptation solutions, including engineering actions, design standards, maintenance and operations measures, equipment specifications, emergency response and recovery measures, and increased risk tolerance and insurance measures
    - Evaluating and prioritizing adaptation solutions based on evaluation of costs and benefits, system vulnerabilities, and priority geographic areas for intervention
    - Develop a prioritized implementation plans describing solutions and budgets for implementation

Proposal Requirements

1. Provide detailed proposed methods and cost breakdown on how deliverables will be met. (Optional deliverables may be included, but separated out from key deliverables.)
2. Detailed schedule
3. Overview of credentials and previous work in this area, specifically within electrical distribution industry.
4. Introduction to team members, including, if any other partner consulting firms, working on project.

Timelines

1. Part 1 deliverables must be complete by June 1st, 2019
2. Part 2 deliverables must be complete by September 1st, 2019

RFP 2018-35
SCHEDULE B - COST SUMMARY SHEET

N.B. Completed Schedule B – Cost Summary Sheet Documentation must be submitted with the overall Proposal in one sealed package.	
RFP:	**2018-35**
DESCRIPTION:	**Climate Impact Study**
PROPONENT:	
TOTAL PRICE (Canadian $):	**/plus HST**
SIGNED:	
DATE:	
PROPONENTS MUST COMPLETE ALL SHEETS FOR PROPOSALS TO BE VALID	

RFP 2018-35
SCHEDULE B - COST SUMMARY SHEET

PRICE BREAKDOWN by DELIVERABLES

Deliverable	Price
Part 1 Formal Report with a Summary Presentation of Key Findings (Due 01 June 2019)	
Part 2 Formal Report with a Summary Presentation of Key Findings and Recommendations Regarding the Development of an Adaptation Plan (Due 28 August 2018)	
Total	

HOURLY RATES for SCOPE ADDITIONS / DELETIONS

Position	2019 Hourly Rates

APPENDIX 1 TO SCHEDULE B

Hydro Ottawa's Expense Policy

TRAVEL

1. The Consultant personnel and/or Subcontractor shall travel by the most practical and economical means possible.
2. When travelling by automobile or taxi, if feasible, The Consultant personnel and/or Subcontractor should travel together to reduce costs.
3. When available and practical, air travel should be booked in economy class.
4. Premium class rail travel is permissible providing it is less expensive than economy air travel.
5. The use of personal automobiles in lieu of rental vehicles or taxis is acceptable when it is more economical to do so.
   Note: Other than the mileage rate referenced below, Hydro Ottawa does not assume any financial and/or insurance responsibility when The Consultant personnel and/or Subcontractor use personal automobiles for business purposes.
6. The Consultant will be reimbursed for the business use of personal automobiles based on current Hydro Ottawa mileage rates which the Consultant shall confirm with Hydro Ottawa prior to a request for reimbursement
7. When renting automobiles for business travel, The Consultant and/or Subcontractor shall rent up to "mid-size" automobiles unless travelling in a group of 3 or more, when "full-size" rentals are permitted.

MEALS

1. The Consultant will be reimbursed for all reasonable meal expenses while travelling on Hydro Ottawa business.
2. Gratuities related to business dining are not to exceed 15%.
3. Individual bills should be obtained when travelling on business and dining with fellow Hydro Ottawa employees.
4. Room service and/or mini bar food items are not reimbursable.

ACCOMMODATION

1. Accommodation expenses will be reimbursed for standard guestrooms.
   Note: Room upgrades are permissible due to last minute/urgent travel when standard rooms are unavailable.

OTHER

1. Original receipts (with details on the date, description of item/service purchased, purchase amount and itemized taxes) must be kept and be made available upon request.
   Note: On an exception basis, a credit card summary can be used to replace a lost receipt.
2. Travel and/or accommodation cancellation charges for reasons outside the control of The Consultant are reimbursable.

EXCLUSIONS

Examples of items that are not reimbursable include:

1. fines/traffic violations
2. premium rates for luxury hotels and automobiles
3. alcohol
4. entertainment/hospitality

Note: *Emergency dry cleaning costs are reimbursable.*

RFP 2018-35
SCHEDULE C - PROPOSAL SIGNATURE FORM

Proponent's Registered Legal Name: _____

Address: _____

_____

Telephone No.: _____

Email Address: _____

The undersigned declare(s) that:

1. He / She / They have the authority to submit this proposal and to bind the Proponent herein named to perform as per the Proponent's Proposal if the Proponent is awarded an Agreement by Hydro Ottawa.
2. He / She / They have not had access to any confidential information that may have provided an unfair competitive advantage relative to this acquisition.
3. All statements, specifications, data, confirmations, and information that have been set out in the Proponent's Proposal are accurate and complete.
4. The Proponent's Proposal is valid and open for acceptance until 17:00:00 on ninetieth (90th) day after the Closing Date.
5. The Proponent has reviewed Part 2 - Terms and Conditions, of the RFP and the Schedules attached thereto and agree to be bound by the same if the Proponent is awarded an Agreement by Hydro Ottawa.

_____ _____
Name: Signature:

Title: _____

Date: _____

_____ _____
Witness Name: Witness Signature:

Title: _____

Date: _____

RFP 2018-35
SCHEDULE D - EVALUATION CRITERIA

Item #	Criteria	Available Points
1	Price	30
2	Schedule	20
3	Proponent's Experience	25
4	Assessment Approach & Methodology	25
Total		100

- **Price:** The lowest priced compliant Proposal will be allocated 30 points; the remaining Proposals will be allocated points based on a percentage of the lowest price.
- **Detailed Schedule:** Breakdown of timelines for each activity and details indicating their level of confidence in their ability to meet schedule commitments with alignment to requirements.
- **Proponent's Experience:** Overview of credentials and previous work in this area, specifically within electrical distribution industry. Introductions to team members, including if any other partner consulting firms, working on the project, highlighting their relevant experience, qualifications.
- **Assessment Approach & Methodology:** The Proponent’s assessment approach, including methodology, and cost breakdown on how deliverables will be met as well as their demonstrated ability to assess clients of a similar size and complexity will be evaluated. (Optional deliverables may be included, but separated out from key deliverables)

RFP 2018-35
SCHEDULE E - CORPORATE INFORMATION AND HISTORY

Corporate History

Provide a brief description to a maximum of two pages total covering the following items:

a) Registered Legal Name

b) Number of years in business

c) Affiliated companies, parent company

d) Corporate status (i.e., Private or publicly traded, Limited, LLP, Sole proprietorship)

e) Annual sales for the past five years

f) Number of employees (salaried – non salaried)

g) Address, telephone and email address for invoice remittance and any other offices/facilities

h) Address of head office, telephone, and fax numbers, e-mail address

i) Provide an organization chart (excluded from the two pages) showing the inter-relationship of the disciplines within your company in place to support the Corporation.

RFP 2018-35
SCHEDULE F - PROPONENT'S INFORMATION

Proponents shall provide the following information:

a) As specified in Section 6 in RFP 2018-35 General Terms, Part 2 – General Terms and Conditions:

The Consultant's contact person is:

Name & Title: _____

Company:_____

Address:_____

_____

Telephone: _____

Email: _____

b) As specified in Section 23 "Notices" in RFP 2018-35 General Terms, Part 2 – General Terms and Conditions:

Consultant's Contact is:

Address:_____

Attention:_____

Email:_____

THIS AGREEMENT dated the __ day of December 2018. ("Effective Date")

BETWEEN:

HYDRO OTTAWA LIMITED (herein referred to as "Hydro Ottawa")

AND:

STANTEC CONSULTING LTD. (herein referred to as the "Consultant")

WHEREAS Hydro Ottawa issued a Request for Proposals on October 23, 2018 for a Climate Impact Study (the "RFP");

AND WHEREAS the Consultant submitted a proposal dated November 14, 2018 in response to the RFP (the "Proposal");

AND WHEREAS the Consultant has represented that it can provide such Work, as more fully set out in Schedules A, in accordance with the terms and conditions hereinafter set forth;

AND WHEREAS the Contractor's Proposal was selected by Hydro Ottawa and, accordingly, Hydro Ottawa and the Contractor wish to execute this Agreement;

NOW THEREFORE in consideration of the mutual covenants, terms and conditions contained herein and for other good and valuable consideration, the receipt and sufficiency of which is hereby irrevocably acknowledged, the parties hereto agree as follows:

1. Work

The Consultant agrees to perform the Services as set out in Schedule A under the general direction and control of Hydro Ottawa, as described in this Agreement. The Consultant shall be solely responsible for the supply of all hardware, software, other technological items or other equipment required to satisfactorily perform the Services.

2. Definitions

In addition to terms defined in the body of these Terms and Conditions and the Schedules thereto, the following terms shall have the meanings set out below:

"Affiliate" means, with respect to any party,

(i) any legal entity of which the securities or other ownership interests representing fifty per cent (50%) or more of the equity or fifty percent (50%) or more of the ordinary voting power or fifty percent (50%) or more of the general partnership interest are, at the time such determination is being made, owned, Controlled or held, directly or indirectly, by such legal entity, or

(ii) any legal entity which, at the time such determination is being made, is Controlling or under common Control with, such legal entity. As used herein, the term "Control", whether used as a noun or verb, refers to the possession, directly or indirectly, of the power to direct, or cause the direction of, the management or policies of a legal entity, whether through the ownership of voting securities, by contract or otherwise.

"Agreement" means this written contract resulting from the RFP and executed between Hydro Ottawa and the Consultant.

"Applicable Law" means any domestic or foreign law, rule, statute, subordinate legislation, regulation, by-law, order, ordinance, protocol, code, guideline, treaty, policy, notice, direction or judicial, arbitral, administrative, ministerial or departmental judgment, award, decree, treaty, directive, or other requirement or guideline published or in force at any time during the Term which applies to or is otherwise intended to govern or regulate any Person, property, transaction, activity, event or other matter, including any rule, order, judgment, directive or other requirement or guideline issued by any Government Authority.

"Business Day(s)" means the hours from 07:00 to 16:30:00, Eastern Time, on the weekdays from Monday to Friday, inclusive, with the exception of statutory holidays observed by Hydro Ottawa.

"Claim" means any actual, or threatened civil, criminal, administrative, regulatory, or arbitral demand, action, suit, investigation or proceeding or any other claim or demand.

"Consultant" means party in contract with Hydro Ottawa or the duly authorized representative. This shall include the Consultant, its officers, directors, employees, agents, assigns, and subcontractors.

"Effective Date" shall mean the date the second party executes this Agreement.

"Governmental Authority" means any government, parliament, legislature or any regulatory authority, agency, commission or a board of any government, parliament or legislature, or any political subdivision thereof, or any court or, without limitation to the foregoing, any other law, regulation or rule making entity or any person acting under the authority of any of the foregoing or any other authority charged with the administration or enforcement of laws.

"Hydro Ottawa" and "HOL" mean Hydro Ottawa Limited.

"Intellectual Property" means:

(a) any and all proprietary rights anywhere in the world provided under:
    (i) patent law;
    (ii) copyright law (including moral rights);
    (iii) trade-mark law;
    (iv) design patent or industrial design law;

(v) semi-conductor chip or mask work or integrated circuit topography law; or any other statutory provision or common law principle applicable to this Agreement, including trade secret law, that may provide a right in either hardware, software, content, documentation, confidential information, trade-marks, ideas, formulae, algorithms, concepts, inventions, processes or know-how generally, or the expression or use of such hardware, software, content, documentation, confidential information, trade-marks, ideas, formulae, algorithms, concepts, inventions, processes or know-how;

(b) any and all applications, registrations, licences, sub-licences, franchises, agreements or any other evidence of a right in any of the foregoing; and

(c) any and all licences and waivers and benefits of waivers of the intellectual property rights set out in paragraphs (a) or b) above, all future income and proceeds from the intellectual property rights set out in paragraphs (a) or (b) above, and all rights to damages and profits by reason of the infringement or violation of any of the intellectual property rights set out in paragraphs (a) or (b) above.

“Losses” means:

(a) any and all damages, Claims, fines, penalties, deficiencies, losses, liabilities (including settlements and judgments) in a monetary settlement or finally awarded by a court, arbitration panel or other adjudicative or quasi-adjudicative panel, having competent jurisdiction, and

(b) related and reasonable costs and expenses (including interest, court costs, reasonable fees and expenses of lawyers, accountants and other experts and professionals or other reasonable fees and expenses of litigation or other proceedings or of any Claim, default or assessment).

"OHSA" means the Occupational Health and Safety Act, R.S. 0. 1990, c. 0.1, as amended or replaced from time to time.

“Person” means any individual, partnership, franchise holder, association, corporation or any Government Authority and their respective employees, agents or representatives.

“Personnel” means the Consultant’s employees, agents, Consultants, and subcontractors

“Personal Information” means information about an identifiable individual, including without limitation any information defined or deemed as such pursuant to any Applicable Laws or regulations related to privacy or data protection.

“Representatives” in reference to party, means the party’s directors, officers, employees, agents, subcontractors, and suppliers, the party’s Affiliates, and all such Affiliates’ respective directors, officers, employees, agents and suppliers.

“Services” means the requested services set out in Schedule A.

3. Priority of Documents

The documents specified below form part of and are incorporated into this Agreement. If there is a discrepancy between the wording of these Terms and Conditions and the wording of any document which appears on the list, the wording of these Terms and Conditions shall prevail. If there is a discrepancy between the wording of any documents which appear on the list, the wording of the document which first appears on the list shall prevail over the wording of any document which subsequently appears on the list:

(a) These General Terms and Conditions
(b) Schedule A - Statement of Work
(c) Schedule B - Cost Summary Sheet

4. Contract Authority

The Contract Authority is:

Joe Brannen, Senior Procurement Agent,
Hydro Ottawa
1970 Merivale Road,
Ottawa, ON K2G 6Y9
Telephone: (613) 738-5499 ext. 7143
Email: joebrannen@hydroottawa.com

The Contract Authority is responsible for the management of this Agreement. Only changes to this Agreement that are authorized in writing by the Contract Authority are binding on Hydro Ottawa. The Consultant shall not perform services outside the scope of the Services without the written authorization of the Contract Authority.

5. Project Manager

Project Manager is:

Matthew McGrath, Supervisor, Maintenance and Reliability,
Hydro Ottawa
1970 Merivale Road
Ottawa, ON K2G 6Y9
Telephone: (613) 738-5499 ext. 7103
Email: matthewmcgrath@hydroottawa.com

The Project Manager is responsible for all matters concerning the technical content of the Services under this Agreement. Any proposed changes to the scope of the Services must be discussed with the Project Manager, but only the Contract Authority has the authority to amend this Agreement.

6. Consultant's Contact

The Consultant's Contact is:

Guy Felio, Senior Associate
Stantec Consulting Ltd.
400-1331 Clyde Avenue
Ottawa. ON K2C 3G4
Telephone: (613) 722-4420
Email: Guy.Felio@stantec.com

7. Compliance with Applicable Laws

(1) The Consultant shall, at its sole expense, obtain and maintain all permits, licenses and approvals required by Applicable Law or Governmental Authority to conduct its business generally and to perform its duties under this Agreement and to undertake and complete the Services. The Consultant and its Representatives shall comply with all Applicable Law, in undertaking and completing the Services

(2) Where there is a conflict between any provisions of the above-mentioned authorities, the most stringent provision will govern.

8. Term

Subject to the termination rights contained in this Agreement, this Agreement shall commence on the effective date and shall terminate on August 30, 2019 (the "Term").

9. Termination and Default

(1) Each of the following will constitute an Event of Default by the Consultant:

(a) The Consultant becomes insolvent, makes a general assignment for the benefit of creditors, permits a Receiver to be appointed for its business or assets or becomes subject to any proceedings under the Bankruptcy *and Insolvency* Act or any statute of any provinces, state or other jurisdiction relating to insolvency or the protection of creditor's rights.

(b) The Consultant fails to perform any material covenant or obligation set forth in this Agreement (except to the extent constituting a separate Event of Default) if such failure is not remedied within ten (10) Business Days after written notice of such failure from Hydro Ottawa.

(c) Any representation made by the Consultant is not materially true or correct in any material respect when made and is not made materially true or correct within two (2) Business Days after receipt by the Consultant of written notice of such fact from Hydro Ottawa.

(d) The Consultant fails to conform to all Applicable Law.

(e) The Consultant has breached or is in breach of Section 21.

(2) If any Event of Default occurs, upon written notice to the Consultant, Hydro Ottawa may terminate this Agreement.

(3) Despite the foregoing, upon the occurrence of an Event of Default referred to in paragraph 1(a), this Agreement shall automatically terminate without notice, act or formality, effective immediately before the occurrence of such Event of Default.

(4) Any termination shall be without prejudice to the rights accruing and remedies subsisting under this Agreement at the date of such termination. In addition, Hydro Ottawa shall be entitled to obtain damages from the Consultant for any losses incurred directly resulting from such Event of Default. Furthermore, in addition to its rights of set-off available to it under this Agreement or at law, Hydro Ottawa may hold back payment or set-off its obligation to make such payment against any payments owed to it if the Consultant fails to comply with its obligations on termination.

(5) Notwithstanding anything to the contrary contained herein, Hydro Ottawa may, at any time prior to the completion of the Services, terminate the Agreement as regards all or any part of the uncompleted services, by giving written notice to the Consultant. Upon receipt of a termination notice, the Consultant shall cease work in accordance with the notice, but shall proceed to complete such part or parts of the Services that are not affected by the termination notice.

(6) In the event of a termination notice being given pursuant to this Section the Consultant shall be entitled to be paid, to the extent that costs have been reasonably and properly incurred for the purposes of performing the Agreement and to the extent that the Consultant has not already been so paid or reimbursed by Hydro Ottawa, on the basis of the pricing set out in the Agreement, for all work completed, inspected and accepted in accordance with the Agreement.

(7) Notwithstanding Section 10, if an event of force majeure continues for 30 days or more, Hydro Ottawa, in its absolute discretion, may terminate this Agreement. In such case, the parties agree that neither will make a claim against the other for damages, costs, expected profits or any other loss arising out of the termination or the event that gave rise to the force majeure.

(8) Upon termination, whether pursuant to this Section or the expiry of the Agreement, at Hydro Ottawa's request the Consultant shall provide a copy of all Hydro Ottawa's records in the format acceptable and indexing to Hydro Ottawa without any delay.

10. Force Majeure

(1) Neither party shall be liable in damages or have the right to terminate this Agreement for any delay or default in performing hereunder if such delay or default is caused by conditions beyond the party's control including, but not limited to Acts of God, Government restrictions (including the denial or cancellation of any permits or other necessary license), wars, insurrections, fires, floods or unusually severe weather, disruptions resulting from labour disputes,

governmental or regulatory action and/or any other cause beyond the reasonable control of the party whose performance is affected.

(2) The delivery requirements specified in the Agreement and affected by such causes shall be extended by periods equal to the duration of the event that gave rise to the force majeure. The Consultant shall immediately notify Hydro Ottawa of any event or situation that might possibly create a situation of force majeure. Acknowledgement of any force majeure is subject to the submission by the Consultant of a written confirmation of proof of the events or circumstances forming the basis of the Consultant's claim regarding force majeure.

11. Representations and Warranty

The Consultant covenants and agrees with and represents and warrants to Hydro Ottawa as follows and covenants and agrees that such representations and warranties shall remain true and correct throughout the Term of this Agreement:

a) Status. The Consultant is duly constituted, validly existing and in good standing under the laws of its governing jurisdiction;

b) Authority. The Consultant has the necessary power, authority and capacity and good and sufficient right to enter into this Agreement on the terms and conditions herein set forth, and the execution and performance of this Agreement will not conflict with, or constitute a breach under, any agreement to which it is a party or any judgment, order, statute or regulation which is applicable to it;

c) Conflict of Interest. The Consultant warrants that it presently has no interest and will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the lawful and ethical performance of the Services under this Agreement;

d) Experience and Financial Capacity. The Consultant has the experience, ability and financial capacity to perform and fulfill its obligations hereunder, and covenants to maintain during the Term, the financial and other ability and authority to perform and fulfill its obligations hereunder;

e) Care and Skill. The Services rendered hereunder are in compliance with Schedule A and shall be performed to that degree of care and skill as is normally performed in the industry in the provision of Services of a similar nature on projects of comparable scope and complexity;

f) Certifications and Qualifications. The Consultant has obtained, at its expense, the necessary valid and current certifications and qualifications that are normally required pursuant to Applicable Laws, if any, and in the industry for the provision of the Services;

g) Valid, Binding and Enforceable. This Agreement constitutes a valid and binding obligation of the Consultant, enforceable against it in accordance with its terms and conditions; and

h) HST Registrant. The Consultant is an "HST Registrant" in good standing; and the Consultant is not a non-resident of Canada within the meaning of the Income Tax Act (Canada), as amended.

12. Intellectual Property

(1) The Consultant retains ownership of its proprietary information and methodologies, which include, but are not limited to, its computer models, analytical approaches, know-how, methods, techniques, processes and skills, and adaptations thereof. Upon completion of the Agreement or in the event of Agreement termination, Hydro Ottawa owns all final appraisals resulting from the Services, subject to the terms of use.

(2) The Consultant warrants that any concepts, products and processes developed by the Consultant under this Agreement will not infringe the patent, trademark, copyright, industrial or other intellectual property rights of another person. The Consultant shall pay the royalties and patent licence fees required for the performance of the Services. The Consultant shall hold Hydro Ottawa harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Consultant's performance of the Services which are attributable to an infringement or an alleged infringement of a patent of invention by the Consultant or anyone for whose acts the Consultant may be liable. If any concept, product or process becomes, or in the Consultant's opinion is likely to become, the subject of an infringement claim, the Consultant shall, at its option and expense, either: (a) procure for Hydro Ottawa the right to continue using the concept, product or process; (b) replace or modify the concept, product or process so that it becomes non-infringing and is substantially equivalent to that which is being replaced or modified; or (c) give Hydro Ottawa a full refund for all fees paid by the Consultant in relation to said concept, product or process.

(3) Hydro Ottawa shall hold the Consultant harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the Consultant's performance of the Services which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the Agreement, which was supplied to the Consultant by Hydro Ottawa as part of the Services.

13. Indemnification

(1) The Consultant shall indemnify, defend, and save harmless Hydro Ottawa, together with Hydro Ottawa's Representatives and assigns, from and against any and all loss, damage, injury, or safety infraction of the Consultant, or its Representatives, under all conditions and all actions, causes of action, proceedings, suits, claims, demands, losses, damages, penalties, costs (including the payment of all legal fees), expenses, obligations and liabilities in connection therewith, attributable to, related to or arising out of:

(a) breaches of the Consultant's, or its Representatives', obligations herein,

(b) any misrepresentation, inaccuracy, incorrectness or breach of any representation or warranty made by the Consultant contained in this Agreement and/or
(c) any of the Consultant's, its Representatives' or transferees', acts or omissions, which constitute negligence, willful misconduct or fraud
(d) breach of Applicable Law by Consultant,
(e) bodily injury, death, or damage, loss or destruction of tangible property caused by the negligence of Consultant.

(2) Hydro Ottawa shall give notice to the Consultant of any claim, action, suit or proceeding referred to in subsection 13(1) and the Consultant shall at its own expense, to the extent requested by Hydro Ottawa, participate in or conduct the defence of any such claim, action, suit or proceeding and any negotiations for settlement of the same, but the Consultant shall not be liable to indemnify Hydro Ottawa for payment of any settlement unless it has consented to the settlement.

(3) Unless prohibited by law, Hydro Ottawa shall indemnify and hold harmless Consultant and its affiliates, including each of their respective employees, from and against any and all liabilities, losses, costs, and reasonable expenses, including but not limited to, reasonable legal fees and expenses and billable hours of client service personnel, which are i) incurred in responding to court orders, discovery, or other similar inquiries associated with or arising from the engagement or ii) arising from or relating to third-party claims based on reliance or purported reliance on Consultant's work product or other alleged loss or damage caused to or alleged by any non-client entity arising from unauthorized access to or reliance upon Consultant's work product. The foregoing indemnification obligations shall not apply in the event that a court of competent jurisdiction finally determines that such claims resulted directly from the negligence, willful misconduct, or fraudulent acts of Consultant.

(4) Hydro Ottawa may elect to participate in or conduct the defence of any such claim, action, suit or proceeding by notifying the Consultant in writing of such election without prejudice to any other rights or remedies of Hydro Ottawa under this Agreement, at law or in equity. Each party participating in the defence shall do so by actively participating with the other's counsel. If the Consultant is requested by Hydro Ottawa to participate in or conduct the defence of any such claim, action, suit or proceeding, Hydro Ottawa agrees to co-operate with and assist the Consultant to the fullest extent possible in the claim, action, suit or proceeding and any related settlement negotiations. If Hydro Ottawa conducts the defence of any such claim, action, suit or proceeding, the Consultant agrees to co-operate with and assist Hydro Ottawa to the fullest extent possible in the claim, action, suit or proceeding and any related settlement negotiations.

14. Insurance

(1) Before commencing any Services under this Agreement, the Consultant shall provide its liability insurance certificate on an Acord form issued by the broker attesting its coverage by a Commercial General Liability Insurance Policy. Hydro Ottawa and its Affiliates must be named as an additional insured by general endorsement on the Consultant's policy. The coverage shall be one million

dollars ($1,000,000) for each occurrence involving bodily injury or property damage. Such coverage must be maintained continuously during the course of the work under the Agreement, and renewal certificates must be provided as required.

(2) The Consultant shall carry Third Party Automobile Liability Insurance Policy, with a minimum limit of 0ne million dollars ($1,000,000) per Occurrence.

(3) The Consultant shall maintain Professional Liability insurance coverage (minimum $1,000,000 per claim) throughout the Term of the Agreement, and for a period of three (3) years after the date of contract completion.

(4) Failure by the Consultant to ensure that the required insurance coverage remain in force during the course of the Agreement will result in the immediate termination of the Agreement without notice and without penalty to Hydro Ottawa.

(5) The Consultant shall maintain Workplace Safety and Insurance Board ("WSIB") coverage at all times during the performance of the Services and during the term of this Agreement for the Services, and shall ensure that any Subcontractor of the Consultant maintain WSIB coverage at all times during their performance of the Services. The Consultant shall provide a WSIB Clearance Certificate indicating that premiums are paid up to date. Failure to maintain up to date WSIB premiums, may result in the immediate termination of this Agreement without penalty to Hydro Ottawa.

15. Subcontracting

(1) In providing the Services contracted for under this Agreement, the Consultant shall act as a single point-of-accountability vendor and shall assume complete and overall contractual responsibility for the provision of the Services and related activities and provide for all ongoing product and performance warranties to the extent set out in this Agreement. The provision of any products or services by any of the Consultant’s subcontractors shall not in any way whatsoever release or discharge the Consultant or derogate from the covenants, representations and warranties provided by the Consultant under this Agreement. Notwithstanding the provision of products or services by any subcontractors, the sole responsibility for the provision of all products or services during the Term lies with the Consultant and in no event shall Hydro Ottawa be compelled to seek or pursue remedy against any of the Consultant’s subcontractors.

(2) The Consultant shall not subcontract or assign the whole or any part of the Agreement without the prior written consent of Hydro Ottawa. Such consent shall be in the sole discretion of Hydro Ottawa and subject to the terms and conditions that may be imposed by Hydro Ottawa. Without limiting the generality of the conditions which Hydro Ottawa may require prior to consenting to the Consultant’s use of a subcontractor, every contract entered into by the Consultant with a subcontractor shall adopt all of the terms and conditions of this Agreement as far as applicable to those parts of the Services provided by the subcontractor. Nothing contained in the Agreement shall create a contractual relationship

between any subcontractor or the subcontractor's Representatives and Hydro Ottawa.

(3) In performing this Agreement, the Consultant shall operate as an independent Consultant, maintaining its own organization as a distinct and separate legal entity from Hydro Ottawa. The Consultant and the Consultant's Representatives shall have no authority to hold themselves out as acting on behalf of or to legally bind Hydro Ottawa. Nothing in this Agreement shall be deemed to constitute a partnership or a joint venture or to create any fiduciary relationship between Hydro Ottawa and the Consultant.

16. Personnel

(1) The Consultant shall employ, and continue to employ throughout the Term, Personnel with the qualifications and business experience necessary to competently undertake and complete the Services pursuant to this Contract.

(2) The Consultant shall provide the services of the resources specified in the Consultant's Proposal dated [*Date*], namely [*Name(s)*] to perform the Services unless it is impossible to do so for reasons which are beyond its control. In such case, the Consultant shall be responsible for providing replacement(s) that shall be of equal or superior ability and attainment.

(3) In no event shall the Consultant allow replacement personnel perform any of the Services until the Consultant has obtained the approval of Hydro Ottawa in accordance with subsection (4).

(4) Prior to replacing personnel, the Consultant shall give written notice to Hydro Ottawa no later than ten (10) business days before the date the proposed replacement is to take effect. The notice shall include the reason for the replacement; and the name, qualifications and experience of the proposed replacement.

(5) The Consultant shall maintain comprehensive policies to ensure a safe work environment. More specifically, the Consultant shall conduct background screening (including, but not limited to, criminal records, employment records, education history, financial and security checks) of its Personnel. When requested by Hydro Ottawa, the Consultant shall provide to Hydro Ottawa criminal background checks acceptable to Hydro Ottawa for all Personnel who will be entering or will have access to Hydro Ottawa premises pursuant to this Agreement.

17. Invoices

(1) Invoices must be submitted in the name of the Consultant and are not to be submitted prior to the performance of the Services. They must show the name and address of the Consultant, together with date, reference to purchase order number, amount charged for services performed during the period, additional charges if applicable, applicable taxes, and description of services provided.

(2) The preferred method of receiving invoices is via e-mail addressed to the Accounts Payable Department at accountspayable@hydroottawa.com. Invoices can also be mailed to the Accounts Payable Department at Hydro Ottawa's office at 3025 Albion Road North, P.O. Box 8700, Ottawa, Ontario, K1G 3S4.

18. Payment

(1) The Consultant's pricing information is contained in Schedule B. Payment shall be based as rates in Schedule B, excluding taxes, and, subject to subsections 18 (2), (3), and (4).

(2) Payment will only be made if a duly completed invoice and any other documents required by the Agreement have been submitted, and verified by Hydro Ottawa, in accordance with the terms of the Agreement.

(3) Hydro Ottawa shall notify the Consultant, within five (5) Business Days of receipt of an invoice or revised invoice, of any inadequacy of the invoice or of the supporting documentation, and where any such notice is given within that period, the date for payment of the amount invoiced shall be postponed until the Consultant remedies the inadequacy to the satisfaction of Hydro Ottawa.

(4) Subject to subsection 18(3), payment will be made within 30 (thirty) days following the date of receipt of a duly completed invoice, in accordance with Section 17.

19. Acceptance

No part of the Services will be accepted unless approved by Hydro Ottawa and Hydro Ottawa is satisfied that the work completed fully complies with the true meaning and intent of the specifications set out in Schedule A - Statement of Work, as confirmed by and through Hydro Ottawa's review of each draft appraisal report. Such acceptance, however, shall not impair any claim that Hydro Ottawa may have for the replacement of defective work or material.

20. Records and Audit

(1) The Consultant shall keep proper accounts and records of the cost to the Consultant of the Services provided and of all expenditures or commitments made by the Consultant in connection therewith, and shall keep all books and records including invoices, receipts, vouchers, cheques, and bank statements relating thereto. The Consultant shall not, without the prior written consent of Hydro Ottawa, dispose of any such accounts, records, invoices, receipts or vouchers until the expiration of seven (7) years after final payment under this Agreement, or until the settlement of all outstanding claims and disputes, whichever is later.

(2) All such accounts and records as well as any invoices, receipts, vouchers, cheques, and bank statements shall at all times during the retention period referred to in subsection 20 (1) be open to audit, inspection and examination by the authorized representatives of Hydro Ottawa, who may make copies and take extracts thereof. Consultant shall furnish all such information as the

representatives of Hydro Ottawa may from time to time require with respect to such accounts, records, invoices, receipts and vouchers.

21. Confidentiality

(1) Each party agrees to
   (a) keep confidential all Confidential Information disclosed to by the other party during the Term of this Agreement and
   (b) not disclose any of such Confidential Information to any third party or any of the third party's Representatives except to such of them to whom disclosure is necessary in connection with this Agreement and who have agreed to be bound by the obligations of confidentiality under this Agreement.

"Confidential Information" means any proprietary ideas, plans and information, including without limitation, information of a technical or business nature (including without limitation, all trade-secrets, technology, financial information, intellectual property, any information relating to human resources matters, data, summaries, reports, the terms of this Agreement, or customer lists, whether oral or written and if written, however produced or reproduced) of a party or any of the party's Affiliates that is received by or otherwise disclosed by one party to the other party that is marked proprietary or confidential, or that would logically be considered proprietary or confidential under the circumstances of its disclosure. In addition, no party shall directly or indirectly use to the party's own advantage any such Confidential Information. If this Agreement is terminated at any time, the parties agree that such Confidential Information provided and all copies thereof (excluding Confidential Information in oral form that has not been put into tangible form) will be immediately returned to the disclosing party or, at the disclosing party's option, destroyed. Notwithstanding the foregoing, the receiving party shall be entitled to keep, subject always to all the provisions of this Agreement, one copy of any notes, analyses, reports or other written material prepared by, or on behalf of, the receiving party that contain Confidential Information for the receiving party's records. In the event of any destruction of Confidential Information as set forth above, the receiving party shall provide to the disclosing party, upon request, a certificate of one of the party's senior officers certifying such destruction.

(2) The Consultant shall:
   (a) collect, use, disclose, and retain Personal Information only as required to fulfil its obligations pursuant to this Agreement;
   (b) take appropriate measures to ensure the privacy and security of all Personal Information, including taking measures to prevent unauthorized access, collection, use, disclosure, copying, modification or disposal; and
   (c) comply with all applicable laws or regulations related to privacy or data protection.

(3) Confidential Information shall not include information that:
   (a) is already known to the recipient at the time of disclosure;
   (b) is or becomes publicly known otherwise than by a breach of this Agreement by the receiving party or the receiving party's Representatives or any third person to whom the receiving party discloses such Confidential Information;
   (c) is communicated to a third party with the express written consent of the

disclosing party;

(d) is independently developed by the recipient without the benefit of having received said confidential information;

(e) is lawfully required to be disclosed, provided that, prior to making such disclosure, to the extent permitted by law, the recipient shall immediately give the disclosing party written notice and cooperate with the disclosing party in applying for an order to prohibit or restrict such disclosure and/or to assure confidential handling of such Confidential Information and the disclosing party shall be responsible for the recipient party's out-of-pocket expenses, including legal fees, and personnel time incurred in responding to such order to prohibit or restrict such disclosure.

(4) Each party shall be responsible for any breach of this Agreement by the party, the party's affiliates, Representatives and any person to whom the party discloses any Confidential Information. Full and faithful performance by each of the parties hereto of all obligations under this Agreement is the essence of this Agreement. Each of the parties hereto acknowledges that monetary damages are not an adequate remedy for violations of the obligations of confidentiality under this Agreement and that any non-compliance or breach thereof shall result in irreparable harm to the disclosing party, and that in such event the disclosing party shall be entitled to equitable relief, including injunctive relief, without prejudice to any other remedies available to the said disclosing party.

(5) The obligations of confidentiality herein shall survive the termination or expiry of this Agreement.

22. Dispute Resolution

Any disagreement or dispute ("Dispute") between the Parties with respect to the performance of the Services under this Agreement or the interpretation of any provision of this Agreement shall be resolved in accordance with the following procedure:

(a) The Parties agree that every effort shall be made to resolve all Disputes at the Project Manager level of either Party.

(b) If the Project Managers are unable to resolve the Dispute within three (3) Business Days, then the Dispute shall be referred to, in the case of Consultant, the President and CFO, and in the case of Hydro Ottawa, the Manager , Asset Planning (the "Executive Representatives"). The Executive Representatives shall make all reasonable efforts to resolve the Dispute within two (2) Business Days of its referral by the Project Managers.

(c) If the Executive Representatives are unable to resolve the Dispute within the time period defined in 22 (b), then either one of them can refer the Dispute to a court located in Ottawa, Ontario.

23. Notices

Any notice required to be given shall be in writing and shall be delivered by hand to the party for which it is intended or sent by electronic mail, prepaid registered mail or prepaid courier directed to such party at the address indicated below, or such other address as any party may stipulate by notice to the other. Any notice delivered by hand or prepaid mail or courier shall be deemed to be received on the date of actual delivery thereof. Any notice delivered by electronic mail shall be deemed to be received on the next day following the date the electronic mail was sent.

Hydro Ottawa Limited

1970 Merivale Road
Ottawa, ON K2G 6Y9

Attention: Mr. Matthew McGrath, Supervisor, Maintenance and Reliability
Email: matthewmcgrath@hydroottawa.com

Stantec Consulting Ltd.

400-1331 Clyde Avenue
Ottawa, ON K2G 3G4

Attention: Guy Felio – Senior Associate
Email: Guy.Felio@stantec.com

24. Successors and Assigns

(1) This Agreement shall enure to the benefit of and be binding upon the parties thereto, and except as otherwise provided therein, upon the executors, administrators, successors, and permitted assigns.

(2) Notwithstanding subsection 24 (1), the Consultant shall not assign its rights under this Agreement, in whole or in part, without the prior written consent of Hydro Ottawa. Hydro Ottawa may apply terms and conditions in respect of such consent.

(3) Hydro Ottawa may assign its rights under this Agreement, in whole or in part, without the prior written consent of the Consultant.

25. Performance

The Services shall be performed in accordance with the approved industrial practices and carried out by technicians or workers skilled and qualified in the type of services required. The Consultant shall conduct itself with the utmost professionalism to ensure good working relations.

If the Consultant is delayed in the performance of the Services by an action or omission of Hydro Ottawa, Hydro Ottawa shall extend the Timelines in Schedule A for such reasonable time as Hydro Ottawa may determine.

26. Time of Essence

Time shall be of the essence of this Agreement.

27. Conflict of Interest

The Consultant warrants that it presently has no interest and will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of the Services under this Agreement.

28. Entire Agreement

The terms and conditions set forth in this Agreement constitute the full and final expression of the contract in respect of the Services, and all matters contemplated in this Agreement, and supersedes all prior quotations, purchase orders, correspondence or communications whether written or oral between the Consultant and Hydro Ottawa. Notwithstanding any contrary language in the Consultant's purchase order, correspondence or other form of acknowledgement, the Consultant shall be bound by this Agreement. ANY ADDITIONAL OR ANY DIFFERENT TERMS ARE REJECTED UNLESS EXPRESSLY AGREED TO IN WRITING BY BOTH HYDRO OTTAWA AND THE CONSULTANT.

29. Amendments and Waivers

No amendment or waiver of any provision of this Agreement shall be binding on either party unless agreed to in writing by such party. No waiver of any provision of this Agreement shall constitute a waiver of any other provision, nor shall any waiver constitute a continuing waiver, unless otherwise provided.

30. Survival

Any terms, which by their nature are intended to survive the termination of this Agreement, shall continue in full force and effect after termination, which terms shall include, but not be limited to Sections 11, 13, 14, 15, 20 & 21.

31. Service Related Terms

Notwithstanding anything to the contrary here or in the Agreement, the following terms will apply to the property insurance appraisal services as set forth in Schedule A provided by Consultant:

Limited Use and Reliance – Hydro Ottawa is the sole intended user of Consultant's report or other work product. Hydro Ottawa may disclose an informational copy of the report or other work product to its audit, tax, legal or insurance professionals acting in an advisory capacity in connection with the purpose of this engagement. Hydro Ottawa shall not reference Consultant or its

work in any public filing or other materials distributed to actual or prospective shareholders, investors, financing parties, or similar third parties without Consultant's prior written consent. No third party shall have the right of reliance on the report, and neither receipt nor possession of the report by any third party shall create any express or implied third-party beneficiary rights.

Engagement Limits – Consultant's report may only be used for the specific purpose or premise of value stated in this Agreement and the report. Consultant's work product is intended to assist Hydro Ottawa in making informed business decisions; it is not a recommendation. Any decisions relating to insurance coverage shall remain Hydro Ottawa's responsibility and be made solely at its discretion.

Information Provided by Client – Consultant will not independently verify information provided by Hydro Ottawa, its advisors, or third parties acting at Hydro Ottawa's direction. Consultant will assume and rely on the accuracy and completeness of all such information.

Limitation of Liability – In no event shall Consultant be liable to Hydro Ottawa (or any person claiming through Hydro Ottawa) under this Agreement, under any legal theory, for any amount in excess of the total professional fees payable by Hydro Ottawa to Consultant in connection with this engagement, except to the extent such liability is directly caused by Consultant's negligence, fraud, or willful misconduct. The foregoing limitation of liability shall not apply to liabilities that arise from personal injury or property damage resulting primarily from Consultant's negligence or willful misconduct. In no event shall Consultant be liable to Hydro Ottawa for any consequential, indirect, lost profit, or similar damages relating to or arising from this engagement.

Environmental Policy – Consultant will not investigate, nor assume responsibility for, the existence or impact of any contamination or hazardous substance related to property or assets associated with this engagement.

IN WITNESS THEREOF the parties hereto have caused this Agreement to be executed by their respective representatives duly authorized in that behalf.

HYDRO OTTAWA LIMITED		**STANTEC CONSULTING LTD.**	
Signature:		Signature:	
Name:		Name:	Arielle Kadoch, P.Eng.
Title:		Title:	Sector Leader Power T&D Canada East
Date:		Date:	2018-12-19
I have authority to bind the corporation		I have authority to bind the corporation	

SCHEDULE A - STATEMENT of WORK

Background

Hydro Ottawa constantly looks at opportunities and threats to its electrical distribution assets to ensure they are able to continue to deliver value throughout their lifecycle. In order to improve upon existing asset management practices, Hydro Ottawa is looking to undertake a distribution system climate vulnerability risk assessment and develop a Climate Change Adaptation Plan. This assessment should generally follow the guidelines set in the Canadian Electricity Association's guide "Adapting to Climate Change, A Risk Management Guide for Utilities" and implement a recognized protocol, such as the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Engineering Protocol. This work will help drive continuous improvement to Hydro Ottawa's Asset Management System.

Key Deliverables

Part 1

Deliverable should be contained within a formal report along with a summary presentation (delivery and slide deck) of key findings.

- ≠ Overview of how the impacts of climate change are likely to affect Hydro Ottawa's electrical distribution system.
- ≠ Outline the need for, and processes by which Hydro Ottawa can continue efforts to better understand its risks, take proactive steps to manage the risks and enhance the resilience of its electrical distribution system to climate change
    - o Identification of risk categories and/ or asset management objectives that should be added/adapted under our Strategic Asset Management Plan
- ≠ Local Climate
    - o Information on present and future climate specific to Hydro Ottawa's service territory (City of Ottawa & Village of Casselman) using a probabilistic approach
- ≠ Weather Effects on Hydro Ottawa Electrical System Performance
    - o Reliability
    - o Worker Safety (working during storm conditions to restore power)
    - o Impact and Risk on various asset classes
        - Overhead system
        - Underground system
        - Substations
        - Metering
    - o Analysis of 3 high impact storm events in Ottawa, including weather and impact on the asset failures in context with forecasted future weather patterns
        - April 16th, 2018
        - May 4th, 2018
        - September 21st, 2018
- ≠ Summary of analysis including an overview of critical areas of focus and priorities for development of an Adaptation Plan

SCHEDULE A - STATEMENT of WORK

Part 2

Deliverable should be contained within a formal report along with a summary presentation (delivery and slide deck) of key findings and recommendations.

- ≠ Develop an Adaptation Plan, following a recognized protocol for climate impact assessment, to improve the resilience of Hydro Ottawa's electrical system.
    - o Enhancing understanding of the projected changes in extreme weather event frequencies and intensities
    - o Detailing links between the climate and future vulnerabilities' impact on system reliability
    - o Projecting impact of climate change on the number of customer service interruptions and quantifying through reliability measures
    - o Identifying areas for priority intervention
    - o Identifying adaptation solutions, including engineering actions, design standards, maintenance and operations measures, equipment specifications, emergency response and recovery measures, and increased risk tolerance and insurance measures
    - o Evaluating and prioritizing adaptation solutions based on evaluation of costs and benefits, system vulnerabilities, and priority geographic areas for intervention
    - o Develop a prioritized implementation plans describing solutions and budgets for implementation

Timelines

1. Part 1 deliverables must be complete by May 31 , 2019
2. Part 2 deliverables must be complete by August 30, 2019

SCHEDULE B - COST SUMMARY SHEET

DESCRIPTION OF SERVICES:	**Climate Impact Study**
CONSULTANT:	**Stantec Consulting Ltd.**
TOTAL PRICE (Canadian $):	**$105,960.00 /plus HST**
PRICE BREAKDOWN BY DELIVERABLES	
Part 1 Formal Report with s Summary of Key Findings (Due 31 May 2019)	**$59,750.50**
Part 2 Formal Report with a Summary Presentation of Key Findings and Recommendations Regarding the Development of an Adaptation Plan (Due 30 August 2019)	**$46,209.50**

SCHEDULE B - COST SUMMARY SHEET

HOURLY RATES for SCOPE ADDITIONS / DELETIONS	
POSITION	**2019 HOURLY RATES**
Guy Felio, Lead Technical Assessor	**$201.00**
Nicole Flanagan, Project Manager	**$149.00**
Dr. Norm Shippee, Ottawa Climate Lead	**$150.00**
Simon Eng, Climate Thresholds and Forensics	**$150.00**
Heather Auld, Senior Advisor	**$201.00**
Daniel Hegg, Quality Reviewer and Resiliency Specialist	**$139.00**
Eric Lafleur, Infrastructure Subject Matter Expert	**$139.00**
Arielle Kadoch, Peer Reviewer	**$155.00**
Pierre-Luc Pigeon, Hydro Ottawa Specialist	**$127.00**
Christina Varner, Climate Change Support	**$112.00**
Administrative Support	**$104.00**

APPENDIX 1 TO SCHEDULE B

Hydro Ottawa's Expense Policy

TRAVEL

1. The Consultant personnel and/or Subcontractor shall travel by the most practical and economical means possible.
2. When travelling by automobile or taxi, if feasible, The Consultant personnel and/or Subcontractor should travel together to reduce costs.
3. When available and practical, air travel should be booked in economy class.
4. Premium class rail travel is permissible providing it is less expensive than economy air travel.
5. The use of personal automobiles in lieu of rental vehicles or taxis is acceptable when it is more economical to do so.
   Note: Other than the mileage rate referenced below, Hydro Ottawa does not assume any financial and/or insurance responsibility when The Consultant personnel and/or Subcontractor use personal automobiles for business purposes.
6. The Consultant will be reimbursed for the business use of personal automobiles based on current Hydro Ottawa mileage rates which the Consultant shall confirm with Hydro Ottawa prior to a request for reimbursement
7. When renting automobiles for business travel, The Consultant and/or Subcontractor shall rent up to "mid-size" automobiles unless travelling in a group of 3 or more, when "full-size" rentals are permitted.

MEALS

1. The Consultant will be reimbursed for all reasonable meal expenses while travelling on Hydro Ottawa business.
2. Gratuities related to business dining are not to exceed 15%.
3. Individual bills should be obtained when travelling on business and dining with fellow Hydro Ottawa employees.
4. Room service and/or mini bar food items are not reimbursable.

ACCOMMODATION

1. Accommodation expenses will be reimbursed for standard guestrooms.
   Note: Room upgrades are permissible due to last minute/urgent travel when standard rooms are unavailable.

OTHER

1. Original receipts (with details on the date, description of item/service purchased, purchase amount and itemized taxes) must be kept and be made available upon request.
   Note: On an exception basis, a credit card summary can be used to replace a lost receipt.
2. Travel and/or accommodation cancellation charges for reasons outside the control of The Consultant are reimbursable.

EXCLUSIONS

Examples of items that are not reimbursable include:

1. fines/traffic violations
2. premium rates for luxury hotels and automobiles
3. alcohol
4. entertainment/hospitality

Note: *Emergency dry cleaning costs are reimbursable.*

INTERROGATORY RESPONSE - EPRF-84

2-EP-55

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. I

SUBJECT AREA: Distribution System Plan

Please file a list of documents and any other information that Hydro Ottawa provided to Stantec for the production of this report.

RESPONSE:

Please note that Stantec disclosed in their report all information provided by Hydro Ottawa.

Please see below a list of documents and other information that Hydro Ottawa provided to Stantec for the production of this report.

- Attachment EPRF-84(A): Hydro Ottawa Asset Management Risk Procedure Matrix
- Attachment EPRF-84(B): IAP0022 Hydro Ottawa Asset Management Risk Procedure R0
- Attachment EPRF-84(C): List of Outage information (Excel File)
- Attachment EPRF-84(D): System Activity Investigation Report - SYS-18-003 R2
- Attachment EPRF-84(E): System Activity Investigation Report - SYS-18-004 R2
- Attachment EPRF-84(F): EEI Storm Recovery Award - 2018 Submission
- Attachment EPRF-84(G): Sept 21 2018 - Tornado After Action Report TS

In addition, Hydro Ottawa provided Stantec with copies of documentation related to the utility's Asset Management Plans. For copies of those materials, please see the response to interrogatory SEC-58.

			Impact				
Risks / Opportunities	Health, Safety & Environment	Safety	Should the main risk or opportunity be classified as a Safety risk, PRO-MS-001.04 shall be evaluated through notifying the Manager, Occupational and Public Safety				
	Health, Safety & Environment	Environment	Should the main risk or opportunity be classified as an Environmental risk, PRO-MS-001.04 shall be evaluated through notifying the Manager, Environment and OHSE Management System				
	Compliance	Compliance	N/A	Noncompliant with corporate regulation/policy	Noncompliant with municipal regulation	N/A	Noncompliant with federal/provincial regulation
	Levels of Service	System Accessibility	N/A	N/A	Load demand is exceeding planning limits	Load demand is exceeding thermal limits	Unable to service new load
	Levels of Service		N/A	N/A	Generation is exceeding planning limits	Generation is exceeding thermal limits	Unable to service new ERFs
	Levels of Service	Service Quality	Service interruption resulting in <10,000 customer minutes interrupted	Service interruption resulting in >10,000 customer minutes interrupted	Service interruption resulting in >500,000 customer minutes interrupted	Service interruption resulting in >3,000,000 customer minutes interrupted	Service interruption resulting in >10,000,000 customer minutes interrupted
	Levels of Service		Service quality resulting in customer complaint, but meets CSA standards	Service quality resulting in customer escalation, but meets CSA standards	N/A	N/A	Service quality resulting in not meeting CSA standards
	Resource Efficiency	Resource	Requires <10 hours of overtime to complete O&M work or undergo training	Requires >10 hours of overtime to complete O&M work or undergo training	Requires >250 hours of overtime to complete O&M work or undergo training	Requires >1,500 hours of overtime to complete O&M work or undergo training	Unable to complete work with internal and/or external resources due to volume or skill gap
	Resource Efficiency		Requires <100 hours of overtime to complete capital work	Requires >100 hours of overtime to complete capital work	Requires >2,500 hours of overtime to complete capital work	Requires >15,000 hours of overtime to complete capital work	
	Asset Value	Financial	Financial risk resulting in an O&M xpense of <$1k	Financial risk resulting in an O&M xpense of >$1k	Financial risk resulting in an O&M xpense of >$50k	Financial risk resulting in an O&M xpense of >$300k	Financial risk resulting in an O&M xpense of >$1M
	Asset Value		Financial risk resulting in a capital expense of <$10k	Financial risk resulting in a capital expense of >$10k	Financial risk resulting in a capital expense of >$500k	Financial risk resulting in a capital expense of >$3M	Financial risk resulting in a capital expense of >$10M
	Corporate Citizenship	Corporate Brand	N/A	Negative publication on social media (remains local)	Negative publications at a municipality level	Negative publications at a provincial level	Negative publications at a national level
	Corporate Citizenship		N/A	Negative customer satisfaction survey results, while above comparators	Negative customer satisfaction survey results, while below comparators	N/A	N/A
			1	4	9	16	25
	Probability		Insignificant	Minor	Moderate	Extensive	Significant
Likelihood	(May occur only in exceptional circumstances)	1	Rare	0	0	0	0	0
	>5% (Could occur)	2	Unlikely	2	8	18	32	50
	>35% (Might occur)	3	Possible	3	12	27	48	75
	>65% (Will probably occur)	4	Likely	4	16	36	64	100
	>95% (Is expected to occur)	5	Almost Certain	5	20	45	80	125

HydroOttawa		TITLE: **Procedure**	
RECOMMENDED:	**C. Murphy, P.Eng**	NO: **IAP0022**	REV: **0**
APPROVED:	**L. Jefferies**		
REV. DATE:	**2018-12-07**		

Asset Management System

Risk Procedure

See Hydro Ottawa's Intranet site for the latest revisions

REVISION SHEET

Revision	Description of Change	Date	Initial
0	Original Document	2018-12-07	cm/lj

Table of Contents

1) Introduction

The purpose of this procedure is to describe the method used at Hydro Ottawa for identifying, assessing and managing risks and opportunities associated with the Asset Management System (AMS) and asset management activities. It aligns with Hydro Ottawa's Enterprise Risk Management approach and the principles described in Hydro Ottawa's IAS0001 - *Asset Management Policy*.

2) References[1]

Hydro Ottawa – IAS0001 – *Asset Management Policy*
Hydro Ottawa – IAS0003 – Strategic *Asset Management Plan*
Hydro Ottawa – *Enterprise Risk Management Charter*
Hydro Ottawa – Risk Register – IAP0022 – *Asset Management System Risk Procedure*
Hydro Ottawa – *PRO-MS-001.04 – OHSE Risk Management (Environmental Aspects and Safety Hazards)*
Hydro Ottawa – TBC – *Project Evaluation Procedure*[2]
British Standards Institution – ISO55001 – *Asset Management – Management System*

3) Scope

This procedure applies to Hydro Ottawa's AMS and asset management activities involving distribution and station assets (further referred to as distribution assets). This procedure does not apply to the evaluation of individual capital and maintenance projects which is covered in *Project Evaluation Procedure*[2].

4) Procedure Description

4.1 Identification of Risks and Opportunities

Risks and opportunities associated with Hydro Ottawa's asset management activities are identified by all employees and communicated to the respective section Manager and/or the Asset Management Council (AMC). In addition, Hydro Ottawa's Internal Audit, Risk and Advisory Service group and external audits will identify risk and opportunities through applicable audits and reporting. The Asset Manager ensures that routine risk and opportunity identification activities take place during Asset Management Council meetings. This includes identifying risks or opportunities over which Hydro Ottawa has control or can be expected to have an influence. These risks and opportunities, along with their rating and control actions are recorded in IAP0022 – *Schedule 1 Risk Register*. Individual activities may be grouped in a rational and manageable manner into classes of similar activities.

It is possible to have more than one risk or opportunity associated for each activity. In these cases, all risk and opportunities are documented.

The wording of the risk or opportunity identification is intended to present to the reader a clear and concise description of the risk or opportunity associated with the activity.

Where achievable, the risk or opportunity is associated with the corresponding strategic risk or opportunity, set by Hydro Ottawa's Enterprise Risk Management group, and strategic objective listed below. Additionally, the risk or opportunity is associated with the corresponding asset management objective as described in IAS0003 – Strategic *Asset Management Plan*.

Strategic Objective	Strategic Risk	Strategic Opportunity
Financial Strength	Stagnant or declining revenue	Increasing revenue
	Declining profitability	Increasing profitability
	Declining financial strength	Increasing financial strength
	Unexpected financial loss	Unexpected financial gain

[1] Most recent revisions of the referenced documents are to be used
[2] Document in progress

Customer Value	Declining service delivery	Improving service delivery
	Declining customer loyalty	Improving customer loyalty
	Declining customer satisfaction	Improving customer satisfaction
Organizational Effectiveness	Declining operational effectiveness	Improving operational effectiveness
	Loss of operational capacity	Gain of operational capacity
	Declining employee morale/motivation	Improving employee morale/motivation
	Unsafe/unhealthy business and work environment	Safe/healthy business and work environment
Corporate Citizenship	Loss of credibility within the community and industry	Gain of credibility within the community and industry
	Erosion of shareholder value	Addition of shareholder value

The Asset Management Council has reviewed and determined impact ratings for risk and opportunity measures aligned with the asset management objectives described in IAS0003 – Strategic *Asset Management Plan*. These measures are described below and shown in the risk matrix described in IAP0022 – *Schedule 1 Risk Register*.

Risk/Opportunity Measures	Description
Safety	Risk or opportunity impacting employee and/or public health and safety
Environmental	Risk or opportunity impacting environmental footprint
Compliance	Risk or opportunity impacting compliance with all internal and external requirements
System Accessibility	Risk or opportunity impacting the connection of load and energy resource facility customers
Service Quality	Risk or opportunity impacting delivery of electric power in a form which meets customer's needs
Resource	Risk or opportunity impacting the additional use of internal or external resources
Financial	Risk or opportunity impacting the realization of value from assets through resulting financial expense
Corporate Brand	Risk or opportunity impacting the perception of Hydro Ottawa to customers, the public and industry leaders

If a risk or opportunity is identified that does not associate with the above list, the Asset Management Council determines whether to amend the above list and the risk matrix.

4.2 Determination of Risk or Opportunity Rating

The risk or opportunity is assessed using a set of criteria which corresponds to numerical values. This can be seen in the risk matrix, as reviewed and determined by the Asset Management Council, and shown in IAP0022 – *Schedule 1 Risk Register*. Risk or opportunity is determined based on the product of the numerical values using of the following equation:

Risk or Opportunity Rating = Probability of Occurrence x Impact of Occurrence

The numerical values assigned for each criterion are listed below.

Probability of Occurrence	
5	Almost Certain (is expected to occur, likelihood > 95%)
4	Likely (will probably occur, likelihood > 65%, but ≤ 95%)
3	Possible (might occur, likelihood > 35%, but ≤ 65%)
2	Unlikely (could occur, likelihood > 5%, but ≤ 35%)
1	Rare (may occur only in exceptional circumstances, likelihood ≤ 5%)

For each risk or opportunity the impact that could result are assessed. The numerical value associated with the risk or opportunity is determined by the severity associated with that respective impact described below.

The severity of the risk impact is ranked based on the worst credible impact, rather than the worst imaginable impact. Alternatively, the severity of the opportunity impact is ranked based on the best credible impact, rather than the best imaginable impact.

Impact of Occurrence	
25	Significant
16	Extensive
9	Moderate
4	Minor
1	Insignificant

Should an activity have multiple risks or opportunities, the risk rating for that activity is the summation of the individual risk ratings for each risk or opportunity.

Should an activity have multiple impacts under a single risk or opportunity category the impact which has the highest risk or opportunity rating, taking probability into consideration, is chosen as the associated impact. (ex. each risk or opportunity has only a single financial impact which results in the highest risk or opportunity rating even if multiple financial impacts are identified)

Should the risk or opportunity identified fall within the category of safety or environment, the Asset Management Council notifies the Manager, Occupational and Public Safety or the Manager, Environment and OHSE Management System, respectively. The risk or opportunity rating will be determined by the respective Manager using the methodology prescribed in PRO-MS-001.04 - OHSE Risk Management (Environmental Aspects and Safety Hazards) and the Manager will align it with the proper classification below for the Asset Management Council to then action as necessary.

The risk or opportunity rating allows for ranking to identify priority initiatives.

4.3 Classification, Action and Documentation of Risk or Opportunity

Each activity will be classified based on the activity's total risk or opportunity rating. The classification will determine the action and documentation required. This will allow for the appropriate controls and effort to be put in place based on the impact of the risk. Opportunities will be actioned following the classification; however, with the intention to realize the opportunity.

Classification	Control Action	Documentation
Low (≤ 10)	Risk is acceptable. Risk reduction not required; however, if risk reduction actions are implemented they are practical and as resources allow.	Decision and control measure (if implemented) recorded with affected stakeholder input.
Medium (11 to 30)	Risk is acceptable. Implement risk reduction actions to reduce risk to "As Low as Reasonably Practicable" (ALARP). Risks will be considered acceptable only if risk reduction is impractical or if its cost is grossly disproportionate to the improvement gained.	Decision and control measure (if implemented) recorded with affected stakeholder input.

High (31 to 60)	Risk is unacceptable. Undertake an "As Low as Reasonably Practicable" (ALARP) assessment Risk reduction is required.	Decision and control measure recorded with affected stakeholder input.
Very High (≥ 61)	Risk is unacceptable. Undertake an "As Low as Reasonably Practicable" (ALARP) assessment. Risk reduction is required.	Mitigation plan recorded with stakeholder input, alternatives assessed, total asset lifecycle cost taken into consideration and recommendation.

4.4 Identification of Controls

The Asset Management Council, through consultation with the relevant sectional Managers, identifies the appropriate control action that Hydro Ottawa undertakes for the asset management activities to address the identified risks and opportunities. Control activities have the ability to reduce the impact of the occurrence, the probability of occurrence or both. The strength of controls is evaluated through the residual risk and opportunity assessment described below.

Types of controls include:
Direct Control – Activities for which Hydro Ottawa is responsible (e.g. any activity conducted by a Hydro Ottawa employee).

Indirect Control – Activities over which Hydro Ottawa can implement some control (e.g. activity controlled by contractors).

No Control – Activities over which Hydro Ottawa has no control.

In addition, a sectional Manager is selected to be responsible for the completion of each risk or opportunity controls along with a timeline. Implementation of the controls may be delegated by the sectional Manager.

4.5 Residual Risk and Opportunity Assessment

4.5.1 Expected Residual Risk and Opportunity Assessment

The Asset Management Council evaluates the proposed controls and assesses the expected risk or opportunity rating should the controls be successful, known as the residual risk or opportunity rating. In doing so, the Asset Management Council ensures all reasonably practical control measures have been included. Additionally, control actions affect the risk or opportunity such that it falls under an acceptable classification.

4.5.2 Actual Residual Risk and Opportunity Assessment

The Asset Management Council evaluates the implementation of the controls and assesses the actual risk or opportunity rating having applied them. If the controls are unsuccessful in achieving the expected objective, the Asset Management Council reviews and determines further control actions. Once the risk or opportunity is deemed to have acceptable residual risk or opportunity rating it will be approved by the Asset Owner.

4.6 Review and Maintenance of Registry of Risks and Opportunities

The Registry of Risks and Opportunities will be reviewed at quarterly Asset Management Council meetings. During this time, control actions and their effectiveness will be discussed, acceptable residual risks and opportunities will be approved, and new risks and opportunities will be identified and recorded into the Registry of Risks and Opportunities as necessary.

Risk and opportunity updates from the quarterly Asset Management Council meetings are communicated through the meeting minutes to the AMS stakeholders.

If a risk or opportunity is classified as very high, the Asset Owner will be notified by the Asset Manager in addition to the communication through meeting minutes.

RFP 2018-35
SCHEDULE C - PROPOSAL SIGNATURE FORM

Proponent's Registered Legal Name: _____

Address: _____

_____

Telephone No.: _____

Email Address: _____

The undersigned declare(s) that:

1. He / She / They have the authority to submit this proposal and to bind the Proponent herein named to perform as per the Proponent's Proposal if the Proponent is awarded an Agreement by Hydro Ottawa.
2. He / She / They have not had access to any confidential information that may have provided an unfair competitive advantage relative to this acquisition.
3. All statements, specifications, data, confirmations, and information that have been set out in the Proponent's Proposal are accurate and complete.
4. The Proponent's Proposal is valid and open for acceptance until 17:00:00 on ninetieth (90th) day after the Closing Date.
5. The Proponent has reviewed Part 2 - Terms and Conditions, of the RFP and the Schedules attached thereto and agree to be bound by the same if the Proponent is awarded an Agreement by Hydro Ottawa.

_____ _____
Name: Signature:

Title: _____

Date: _____

_____ _____
Witness Name: Witness Signature:

Title: _____

Date: _____

System Activity Investigation Report

Report No. :	SYS-18-004	**Issue Date:**	04/05/2018
Prepared By:	Maiss A./ Margaret F.	**Revision #:**	1

Event Date:	04/05/2018	**Location:**	Ottawa
Area:	East/West/Central/South		
Circuit(s) Affected:	Various circuits		
Customers Interrupted:	About 45,000		
Duration of Interruption:	Dependent on location		
Failed Apparatus:	Poles		

1. INTRODUCTION

During the May wind storm, the extremely high winds caused many downed power lines and broken poles resulting in numerous outages in the Ottawa region. There was damage throughout the whole city with the East area being the most affected. Falling trees and branches caused the majority of the power outages. The effects of the May wind storm on Hydro Ottawa's distribution system are summarized in this report.

2. OUTAGE EVENT DETAILS

The storm started on Friday night May 4th and lasted until Saturday morning May 5th, while outages and repairs took place until Saturday night May 5th. During the storm, the winds reached approximately 100 km/h in the Ottawa region. The high winds caused significant damage to trees, buildings, poles and power lines. In total, there were 15 broken poles, more than 100 outages, and approximately 45,000 customers without power in the area serviced by Hydro Ottawa.

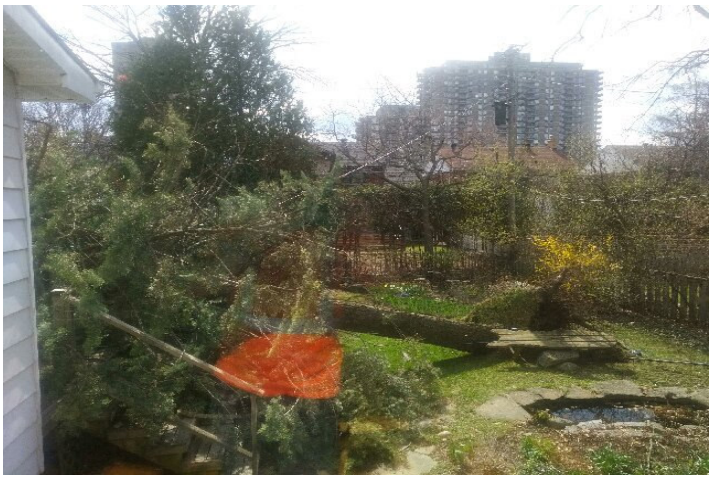

Figure 1: A large tree fell on a house and service conductor in Island Park area causing an outage

3. INVESTIGATION

In the West area, there were two broken poles. Details are shown in **Table 1**:

Table 1: Broken poles in the West area

Asset ID(s)	Age	# of phases	Orientation	Framing
X10716	44	3	E/W	Crossarm
X57529	46	9	N/S	Triangular

In the Central area, there were four broken poles. Details are shown in **Table 2**:

Table 2: Broken poles in the Central area

Asset ID(s)	Age	# of phases	Orientation	Framing
X35323	61	3	N/S	Crossarm
X50724	54	3	N/S	Crossarm
55C3C-0182	49	3	E/W	Crossarm
X50034	46	3	N/S	Crossarm

In the South area, there were three broken poles. Details are shown in **Table 3**:

Table 3: Broken poles in the South area

Asset ID(s)	Age	# of phases	Orientation	Framing
X5039	4	6	N/S	Vertical
unknown (1453 Woodroffe Ave)	45	9	E/W	Triangular
unknown (70 Oakridge Blvd)	46	---	N/S	Triangular

In the East area, there were six broken poles. Details are shown in **Table 4**:

Table 4: Broken poles in the East area

Asset ID(s)	Age	# of phases	Orientation	Framing
X23085	52	2	N/S	Crossarm
54C2D-0006	64	1	N/S	---
X20963	28	3	E/W	Triangular
GL000067	40	3	N/S	Triangular
X18618	30	6	E/W	Triangular
X09511	---	3	N/S	Crossarm

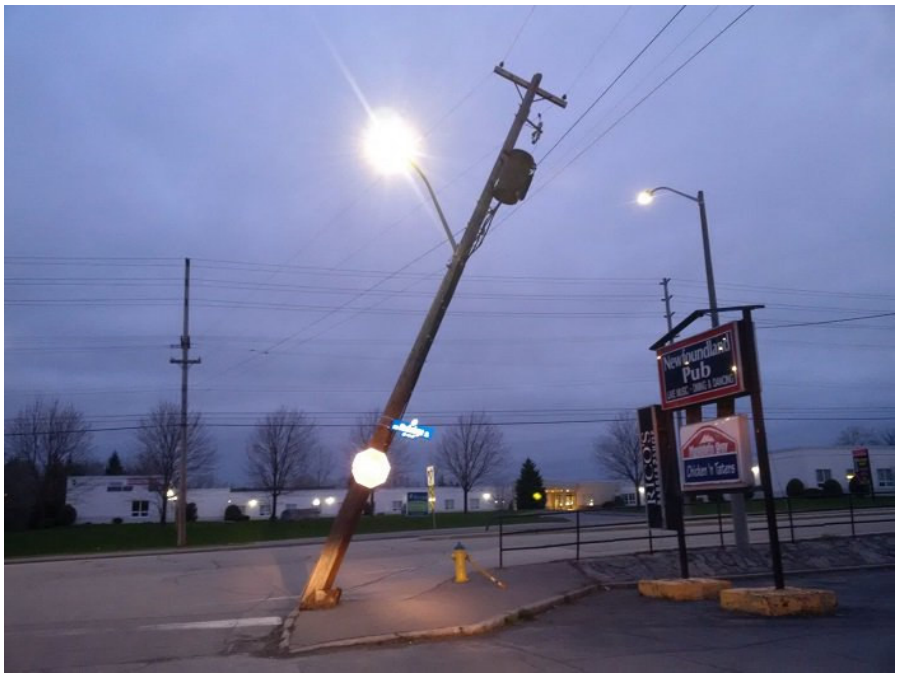

Figure 3: The X23085 broken pole on 940 Montreal Road

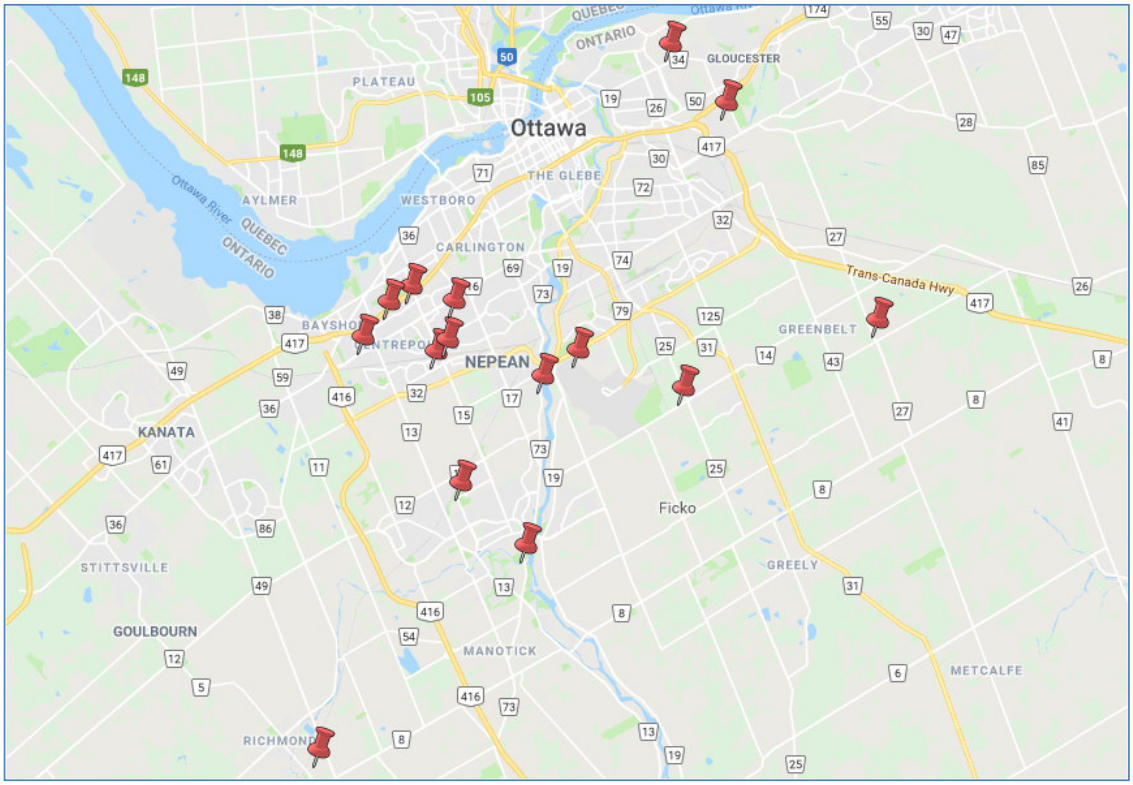

Figure 4: Map locations of the broken poles

Inspection results for only five of the broken poles recorded in 2016 was available. This information is shown in **Table 5**.

Table 5: 2016 inspection results for the broken poles

Pole Number	Top Condition	Shell Condition	Sound Test	Overall Visual & Sound	Interpretation of drill Test Results
X20963	Fair, Some deterioration	Fair, Some deterioration	Sound Bad, Drilled Minor Pocket	Fair Condition	Internal Decay - Minor
55C3C-0182	Fair, Some deterioration	Fair, Some deterioration	Sounded Good, No Drill	Fair Condition	Sound Pole
X09511	Fair, Some deterioration	Fair, Some deterioration	Sounded Good, No Drill	Fair Condition	N/A
X50724	Bad, Significant Deterioration	Bad, significant deterioration	Sound Bad, Drilled Minor Pocket	Poor Condition	Internal Decay - Minor
X50034	Good, Normal, No Problem	Good, normal, No Problem	Sounded Good, Drilled Solid	Good Condition	Sound Pole

4. ANALYSIS

Broken poles resulting from the May wind storm were scattered around the city of Ottawa with most of the broken poles located in the East area. The large majority (70%) of broken poles was estimated to within 40 to 64 years old and had a N/S orientation with a varying number of phases on them. Therefore, no specific trends were observed other than pole the pole orientation. This relates to observations made in the April Storm Report (SYS-18-003), in which 31 of the 33 broken poles had a N/S orientation. In the April Storm Report, a design review was conducted on the N/S overhead lines for the Limebank broken poles. However, the analysis performed on the Limebank broken poles was not able to determine a set of criteria to use for identifying N/S overhead lines at risk during extreme weather conditions since several factors contributed to the breaking of the poles.

From the inspection information available, it is observed that only one pole had a poor condition as per visual inspection and two poles had minor internal decay as per drill test results.

5. RECOMMENDATIONS

There are many aspects to be considered, in order to attempt to prevent this issue from reoccurring, similarly as discussed in the April Storm Report (SYS-18-003). It is recommended to get more accurate data and pictures regarding the condition of the pole before and after the storm, which can help determine the exact reason for the damage. This can be done by dispatching damage assessors as per WCS0013- Damage Assessment and Wire Guard. Finally, a design review of the two proposed N/S overhead lines identified in the April investigation should be concluded in order to accurately determine a set of criteria to identify areas at risk.

1. **I nominate the following company:** Hydro Ottawa
2. **Category:** Emergency Recovery Award
3. **CEO Name:** Bryce Conrad
4. **CEO Title:** President and CEO

Who should we contact for further information about this nomination?

5. **Contact Name:** Sara Chesiuk
6. **Contact Title:** Talent Management Specialist
7. **Contact Email:** sarachesiuk@hydroottawa.com
8. **Contact Phone:** 613-738-5499 x2328

Winning nominations will be highlighted in a press release. Please provide details for your corporate media relations contact.

9. **Press Name:** Dan Seguin
10. **Press Title:** Manager Media and Public Affairs
11. **Press Email:** DanSeguin@hydroottawa.com
12. **Press Phone:** 613-738-5499 x2345
13. **Date(s) of the event:** September 21, 2018
14. **Date(s) of the recovery period:** September 21 – September 26, 2018
15. **Type of event:** Tornado
16. **Summary of storm - Please provide a brief summary of the event (e.g., wind speeds, rain/snow amount, tornado data, size and location of impacted area). (100 word max.)**

On September 21, 2018, the City of Ottawa experienced two tornados – an EF-3 tornado with wind speeds of up to 265 km/h and an EF-2 tornado with wind speeds of up to 220 km/h. The tornados resulted in more than 200 power outages across the western and southern parts of Hydro Ottawa's service territory, causing 171,462 of our customers to lose power. The tornados also caused extensive

Comment [S1]: 250 outages and 207,407 customers affected are the final numbers, however the numbers we reported publically are 200 outages and 171,462 customers affected.

damage to the provincial transmission system, including Hydro One's Merivale Transformer Station, causing outages in our central service territory due to outages at a number of Hydro Ottawa's substations.

17. **Miles of distribution line replaced:** 2.7 Miles (4.35kms)

18. **Company's total distribution feeders affected:** 395 Feeders (49% of total feeders)

19. **Number of feeders locked out:** 24

20. **Total number of trouble cases:** 9,275

21. **Number of distribution poles replaced (Number replaced and approximate total number on your system) (one line):**

    67 distribution poles out of 48,976

22. **Distribution transformers (Number replaced and approximate total number on your system)**

    13 distribution transformers out of 31,416

23. **Transmission line (Number of transmission circuits locked out and percent of company's total transmission system)**

Extensive damage to Hydro One's Transmission system led to supply interruptions to large portions of Hydro Ottawa's system.

24. **Transmission towers (Number of transmission structures replaced):**

    N/A – see question 23

25. **Substations - Note any damage and repairs to substations (50 word max)**

Station battery banks at 14 of our substations were disconnected to avoid drainage from loss of supply to grid. A feeder was replaced at one of our substations due to a failed protection relay. Hydro One's Merivale Transformer Station suffered extensive damage, affecting supply to numerous Hydro Ottawa substations.

26. **Generation - Note any damage and repairs to generation assets (50 word max):**

There was no damage to any generation facilities; however the extent of the outages left generation facilities stranded.

27. **Peak sustained outages - At peak, number of customers with sustained (not momentary) outages and percentage of total customers (one line):**

    171,462 customer outages (51.3%% of total customers in service territory)

28. **Total outages:** 200 separate outages impacting 171,462 customers

29. **Restoration - Please note the percent and number of customers restored by day until 100% restoration.**

    End of day 21st – 171,462 customers out and 51.3%

    End of day 22nd – 79,627 customers out and 23%

    End of day 23rd – 14,733 customers out and 4%

    End of day 24th – 1,761 customers out and 1%

    End of day 25th – 0 customers out and 0%

30. **Unable to take power (one line):**

    15 customers unable to take power due to damage to their homes and electrical services

31. **Cost - Estimated financial cost to the company:**

    $1.8M

32. **Man-hours - Estimated man-hours spent by your company and regular contractors (one line):**

    3,824.5

33. **Visiting man-hour - Estimate man-hours spent by visiting contractors and assisting companies (one line)**

    2,360.5 hrs

34. **Assistance: electrical - Approximate number of electrical workers assisting from outside your system (one line)**

    86

35. **Assistance: tree/vegetation - Approximate number of tree/vegetation workers assisting from outside your system (one line)**

    12

36. **Assistance: other - Approximate number of other workers assisting (one line)**

Comment [S2]: 334,425 customers as of September

Comment [S3]:
Regular = 1,268, OT = 2,556.5

Comment [S4]:
K-Line – 40 staff (rotated through, not at once), 1080 hours
Dundas – 13 staff – 374 Hours
Thirau – 8 staff , 322 hours
Sproule 7 staff , 224.5 hours
Alectra – 18 staff – 360 hours

Comment [S5]:
Davey Tree 6 staff
Asplundh 6 staff

Comment [S6]:
Civil Contractors:
Teraflex 8
Lourenco & Botelho 12
Bradley Kelly Construction – 24
Antrim - 5

49

37. **Assisting states - States workers came from:**

    Workers from Alectra Utilities out of central Ontario

38. **Safety OSHA - Number of OSHA reportable personnel accidents:**

    0

39. **Safety DOT - Number of DOT reportable vehicle accidents:**

    0

40. **Accident details:** N/A

41. **Fatalities:** N/A

42. **Description of storm - Please provide a description of the storm. Briefly describe the event, the extent of damage, and any specific situations that made responding to the disaster particularly difficult. (300 word max)**

On September 21, 2018, the City of Ottawa experienced two tornados resulting in more than 200 separate power outages across the western and southern parts of Hydro Ottawa's service territory, causing 171,462 of our customers to lose power. The first tornado tracked 10 km between 4:00 p.m. and 5:20 p.m. It destroyed numerous buildings, overturned vehicles, and snapped many trees and hydro poles. Environment Canada indicated that this was a powerful EF-3 tornado with wind speeds of up to 265 km/h. The second tornado hit at approximately 6:00 p.m. causing similar damage as the first. Assessment of the damage indicated that this was an EF-2 tornado with wind speeds of up to 220 km/h. The tornados also caused extensive damage to the provincial transmission system, including Hydro One's Merivale Transformer Station, causing outages in our central service territory due to resulting supply disruption at a number of Hydro Ottawa's substations. The tornadoes were preceded by severe thunderstorms throughout the Ottawa-Gatineau region.

To date, the Ottawa-Gatineau tornados have caused $295 million of reported property damage, both residential and business.

43. **Description of recovery efforts - Please provide a description of your recovery efforts. Emphasize as appropriate: emergency preparedness plans or drills, management, communication efforts, innovative techniques, lessons learned. (500 word max)**

Due to the extreme weather we were tracking on September 21, 2018, our System Office took a proactive approach to recovery. Earlier in the day members of Hydro Ottawa's Operations Management team, Executive Management Team, and Crisis Communication Team (CCT) came together to discuss the

impending storm and restoration and communications strategies, as well as to set-up area work centers and the Incident Command Centre.

When the State of Emergency was called at 5:00 p.m., Hydro Ottawa crews were ready to deal with the tornado aftermath. As our service territory saw more than 200 individual power outages and 171,462 customers without power, restoration efforts began at immediately after the tornadoes passed on September 21 and ended October 1, 2018, with the majority restored by September 25, 2018.

By the evening of the September 24, 2018, Hydro Ottawa's primary lines had been rebuilt and Hydro One had reconfigured the transmission supply to our substations. From that point forward, there remained a number of customer outages made up of small scale and individual customer outages, mostly in the southern part of our service territory. By Wednesday September 25, 2018 the remaining customers without damaged services had been restored, with a small amount of follow up work taking place throughout the week.

In tandem with the restoration efforts, our Crisis Communication Team (CCT) was hard at work ensuring our customers were provided with as much information as possible. As soon as the storm struck, customers flooded Hydro Ottawa's outage communication channels, which include our website, social media platforms and Outage Reporting and Information Phone Lines. With our Outage Line and website experiencing unprecedented volume, social media became the lifeblood of our CCT. In order to demonstrate the extent of the damage caused by the storm and provide residents with an idea of the repairs needed for restoration, a videographer and photographers were deployed into the field to document both damage, as well as restoration efforts. This was then leveraged by the social media team when communicating with customers.

The September tornados provided us with some key lessons. The first was the importance of a centralized contractor management process, which was deployed for the first time during the storm. As Hydro Ottawa worked with a number of external contractors, such as our Mutual Aid partners, underground utilities, electrical installations contractors and tree care service providers, it was essential to assign one key point of contact to direct all external resources, making planning and dispatching more efficient and effective.

44. **Additional stories - If there were any especially unusual events or human interest stories, you may add them here (250 word max).**

The Hydro Ottawa website sees roughly 15,000 sessions on a typical day. Over the duration of the outage, web traffic increased drastically with 940,549 sessions over the four day period. Through the first 36 hours of the storm, the site's outage map was unable to process the vast amount of outage data required to display outages. Similarly, the outage component of the Hydro Ottawa app did not function throughout the weekend; therefore Hydro Ottawa's Crisis Communication Team had to leverage social media more than ever to update our customers. Leveraging media outlets, an engaging, informative and sympathetic voice on social media, coupled with strong visuals – both photo and video – were Hydro Ottawa's strongest assets in preserving the corporate reputation.

While social media is always a focus during a crisis event, Twitter became the lifeblood of our customer communications during the outage as other means of communicating to customers were not available. Social media engagement increased significantly, seeing more than 15,000 mentions on Twitter over the four days, and followers growing by 14,000 or 75% increase in audience. Outage communications also took place on Facebook, with followers growing by 2,700 over the event, or 63%.

Positive public perception of Hydro Ottawa increased throughout the storm, as residents, businesses and key stakeholders saw firsthand our efforts to restore this essential service. The outpouring of gratitude from the community, both for our restoration efforts, and our up-to-date and transparent communication, was unprecedented.

45. **Optional photos - You may also attach a few photos of the damage, work crews, maps or other supporting material. Please limit to three pages.**

    - **Videos of damage**
    - **Videos with supervisors**
    - **Images of damage**
    - **Image of Thank You messages?**

After Action Report

Event Name: Storm Sept 21-26th

Prepared By: Tony Stinziano

Table of Contents

Executive Summary

On September 21st, 2018, the City of Ottawa experienced a severe weather event which began at approximately 5pm. Tornadoes with wind gusts with speeds up to 265km/h were reported to have hit in the western & southern part of Hydro Ottawa's service territory causing 171,462 customers to lose power. Numerous trees and branches came down taking with them various sections of primary circuits as well as hundreds of individual customer secondary lines. The Tornado also caused damage to the provincial transmission system including extensive damage to Hydro One's Merivale TS. This loss of supply from the provincial grid further impacted customers in the central areas due to outages at a number of Hydro Ottawa's substations.

Hydro Ottawa declared a state of emergency at 5pm on September 21st . System Office took a proactive approach earlier in the day to discuss the impending weather event with on call & operations management. Area work centers & the ICC began to setup around 4pm. Carling work center was setup but shutdown due to power outage. Central crews were dispatched from the East work centre.

All crews were focused on restoration efforts for the duration of the event, which lasted until Sunday October 1st. Due to the extensive damage caused the storm, the initial customer count was 171,462 primarily as a result of loss of supply from the provincial grid. By the evening of the 24th, the primary lines had been rebuilt, as well as Hydro One work to reconfigure transmission supply to Hydro Ottawa substations, and 95% of the customers were restored. From that point forward there remained a number of customer outages made up of small scale outages and individual customer outages, mostly in the Arlington Woods/Craig Henry areas.

By Wednesday Sept 26th the remaining customers without damaged services had been restored, with a small amount of follow up work taking place which continues today. Many customers experienced damage to their homes and customer owned connection assets, requiring the customers to complete work prior to Hydro Ottawa re-connection.

Although the restoration efforts went well, there exists a number of areas that Hydro Ottawa can improve. Some of the areas of improvement are as simple as following the defined EERP plan closely. Other areas for improvement are around technology, communication and training needs. The action item list at the end of this document outlines the various activities requiring attention and the expected timelines to complete them.

Event Overview

On September 21st Hydro Ottawa's service territory experienced tornadoes with winds up to 265km/hr. Hydro Ottawa's response lasted five days with all crews focused on restoration efforts. The EERP was activated as was the CCT. At the height of the outage Hydro Ottawa had 171,462 customers without power. Loss of supply from the provincial grid due to damage on the transmission system and at Merivale TS, along with main trunk distribution lines being downed on major arterials accounted for the high number of outages.

By the end of the third day 95% of the customers had been restored leaving the majority of the remaining outages in the hardest hit Arlington Woods area. Many of the customer outages involved tree clearing, customer side repair work and ESA permits for reconnection.

As in any storm event Hydro Ottawa focused on making all situations safe first followed by strong external communication then organized restoration. The majority of the outages affected circuits & stations in the City's Central, West, & South service territory. As a result the South, West, & East work centers were activated to dispatch calls and organize crews with the support of the ICC team at Merivale. The central work centre was activated but shut down due to the power outage at Carling, crews were then dispatched from the East work centre.

Debrief

On October 15th, a meeting was held with all management parties involved in the restoration efforts to review the event, discuss what worked well and what did not. As a result a number of action items have been created with designated leads as well as expected timelines for completion.

Observations
- Overall employee response from across the organization was great along with support from all work groups - Supervisors showed great leadership and dedication - Good ICC update emails - Centralized contractor management worked well – opportunities to make it better - Dedicated ESA inspectors - Presence of new people leaders - System Operations monitored the weather early Friday and began reaching out to area Ops managers, On call staff and start storm response discussions. - The SCADA System performed exceptionally well considering the fact that it is so new and is still being understood by the operators and admin staff. - Contractor & Mutual aid response was good - Overnight staff did good job creating work plan for following day
- Opportunity for Improvement
Technology - Communications – as cell towers lost power, cell phone coverage began to deteriorate early on, was issues with Radio comms at one point as well. Internet was lost at Maple Grove work centre due to outage at Carling where comms infrastructure is located. - Outage Map – IT looking into a revamp - Use of 4Command – alternate tool vs regular training/use **Process** - Food – difficult to find in a timely fashion due to the large outage areas affected - Logistics - Fuel for generators, accommodations for contractors/mutual aid support, - The process for accepting or reaching out for Mutual Aid needs to be defined - Internal communications to HOL employees on the event – Crisis Management team activation - Hydro One – receiving timely and accurate information was an issue, formal emergency response plan - EO Generation – communication with affected generators **Contractors** - Creation of Centralized Contractor Management function during major events – (ie. 5th work center setup) - Manage all outside resources **People** - Training o Need quarterly mock storm response exercises o Create understanding of roles & responsibilities o ICC, CMT, EOC processes o Technology use o Shift changes & hand off process/expectations o Effective communication requirements/expectations during a major event

- Resourcing of area work centers –
    - Ops supervisors who typically fill these roles were required in the field
    - Opportunity to leverage & train the engineers, design supervisors, other non-trades DEAM/DOP supervisors
- Updating of ICC Roster staff in the EERP
    - Ensure staff who are taking on these responsibilities understand their accountabilities
- Who is qualified to take on an OPS field supervisor role during a storm?

Action Items

Item	Description	Accountable	Due Date
1.	EERP Training – Exercises – Mock Simulations	Doug Baldock	November 20th, 2018
2.	Updating ICC Roster staff in EERP	Doug Baldock, Joseph Muglia, Guillaume Paradis	November 2nd, 2018
3.	Development Centralized Contractor Management Function for Storm Response	Brent Fletcher	December 14th, 2018
4.	Outage Map Review	Charles Berndt	December 14th, 2018
5.	Communications Technology Review	Patrick Farrell	December 14th, 2018
6.	Logistics Support Review	Dave Ayer/Dale Williams	December 14th, 2018
7	Process for reaching out & accepting Mutual Aid	Doug Baldock/Jeff Bracken	November 20th,. 2018
8	Food availability for HOL staff during storm events	Bruce Lang	November 20th, 2018
9	Hydro One – Communication process/expectations during major event	Doug Baldock/Greg McAuley	November 20th, 2018
10			
11			
12			
13			
14			
15			

Conclusion

The storm that took place on September 21st resulted in wide scale outages across half of Hydro Ottawa's service territory. While Hydro Ottawa's response was good, there exists room for improvement. The largest improvement suggested would be to simply follow the EERP as designed from the start of an event, or better before the start of an event. Proper organization of the ICC and work centers with a strong compliment of staff in the various roles identified ensures the right people are present to deal with issue as they come as well as ensure a smooth process throughout.

It is suggested that with the action items noted above, Hydro Ottawa's emergency response will only improve moving forward.

Action Item Follow Ups

INTERROGATORY RESPONSE - EPRF-85

2-EP-56

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. I

SUBJECT AREA: Distribution System Plan

a) Please file the CVs of the authors of the report.

b) Is Hydro Ottawa planning to qualify the authors of the report as expert witnesses? If the answer is yes, please file the OEB Acknowledgement of Expert Duty Form "A" for each author. If the answer is no, please explain why not.

RESPONSE:

a) Please see Attachment EPRF-85(A): Appendix A Curriculum Vitae.

b) Yes. Expert Duty Form "A"s for Norman Shippe and Guy Félio were filed via the OEB's Regulatory Electronic Submission System on May 28, 2020.

Stantec

APPENDIX A Curriculum Vitae

Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

Stantec

Guy is an infrastructure Management and Infrastructure Resilience Specialist with over 30 years of experience in civil, geotechnical, and municipal engineering. He focuses on finding practical, innovative, and cost-effective sustainable and resilient solutions for clients, in particular the owners and operators of infrastructure and facilities. He draws on his research, policy development, engineering and teaching experience in his approach to problem-solving.

Areas in which Guy has been contributing to build better communities include: the elaboration of asset management governance frameworks, policies and strategies; the development of municipal asset management and long-term financial plans; life-cycle cost/benefit analysis studies; the assessment of risks to infrastructure from climate changes and the development of adaptation solutions.

EDUCATION

B.A. Sc., (Civil Engineering), University of Ottawa, Ottawa, Ontario, 1978

M.Eng., (Civil Engineering), Carleton University, Ottawa, Ontario, 1981

Ph.D., (Civil Engineering - Geotechnical), Texas A&M University, College Station, Texas, 1985

CERTIFICATIONS & TRAINING

Lean Six Sigma - Yellow Belt (Progressing towards Black Belt), Ottawa, Ontario, 2016

Infrastructure Resilience Professional (IRP) - Climate Certification, Ottawa, Ontario, 2016

REGISTRATIONS

Registered Engineer, Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists

Registered Engineer, Professional Engineers Ontario

MEMBERSHIPS

Member, Editorial Board, Public Works Management & Policy Journal

Member, Editorial Board, International Journal of Climate Change Strategies and Management

Member, Ouranos Built Environment Program Committee

Member, Canadian Network of Asset Managers

Member, National Committee on Climate Change, Canadian Water and Wastewater Association

AWARDS

2001 NRC Corporate Award - Public Awareness:, NRC Engineering Challenge

2003 NRC Corporate Award - Public Awareness:, National Guide to Sustainable Municipal Infrastructure - "InfraGuide"

2013 Fellow Status, Canadian Society for Civil Engineering (CSCE)

2015 Distinguished Professional Engineer Award - Ottawa Chapter

** denotes projects completed with other firms*

Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

PROJECT EXPERIENCE

Climate Change Adaptation

Review of Climate Considerations in Water Resources Infrastructure Codes and Standards* (Research, Analysis; Author)
Client: Engineers Canada
As part of Engineers Canada's review of infrastructure codes, standards and related instruments (CSRI), conducted the review in the area of Stormwater, Wastewater and Water Resources infrastructure categories. The objective of this assignment was to produce a final consensus report that provided recommendations on the need and nature of reviews of infrastructure codes, standards and related instruments for adjustments to, or the addition of, climate parameters for those jurisdictions where engineering vulnerability assessments using the PIEVC Engineering Protocol had been completed.

Vulnerability Assessments of Infrastructure to Climate Change using the PIEVC Protocol* (PIEVC Protocol Advisor)
Client: Various
Provided advisory services to conduct infrastructure vulnerability to climate change assessments using Engineers Canada's PIEVC Protocol:
• Credit Valley Conservation Authority (CVCA), ON – Cooksville area stormwater management infrastructure.
• Transport Canada – vulnerability assessment of three airports in Northern Canada.
• City of Trois Rivieres, QC – risk assessment and adaptation recommendation for the City's water an stormwater infrastructure.
• City of Laval, QC – vulnerability and risk assessment of drainage control structures.
• City of Limon, Costa Rica – as part of the Canadian PIEVC Advisory Team, provided support to engineers in Costa Rica in the vulnerability assessment of wastewater infrastructure.

Climate Change Vulnerability Assessment of the Water and Wastewater Systems of the Moose Cree First Nation in Moose Factory (ON), Moose Factory, Ontario (Project Manager, PIEVC Climate Risk Assessment specialist)
Client: Ontario First Nations Technical Services Corporation (OFNTSC)
Project Value: CAD 180,000
The application of a modified Engineers Canada's PIEVC climate change vulnerability assessment methodology – the First Nations PIEVC Protocol, was used in the community of the Moose Cree First Nation (Moose Factory, Northern Ontario) to assess the risks due to extreme weather and future climate uncertainty for the island's and wastewater infrastructure.

Climate Change Vulnerability Assessment of Housing for the Oneida Nation of the Thames (Ontario), Oneida, Ontario (Project Manager, PIEVC Process Advisor, Facilitator)
Client: Ontario First Nations Technical Services Corporation (OFNTSC)
Project Value: CAD 135,000
The application of a modified Engineers Canada's PIEVC climate change vulnerability assessment methodology – the First Nations PIEVC Protocol, was used in the community of the Oneida Nation of the Thames (South-west Ontario) to assess the risks due to extreme weather and future climate uncertainty for the housing (residential and Seniors Complex), school and support infrastructure.

** denotes projects completed with other firms*

Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

Development of a First Nations PIEVC/Asset Management Toolkit (Project Manager, Subject Matter Expert, Trainer)
Client: Ontario First Nations Technical Services Corporation - OFNTSC with funding from OCCIAR
In this project, the lessons learned from the Akwesasne and other PIEVC studies are used to develop a FN PIEVC/Asset Management Toolkit tailored to First Nations communities. This new tool will be used in training and education sessions in Ontario and across Canada (Project in progress).

Climate Change Vulnerability Assessment of Water and Wastewater Infrastructure in Akwesasne, ON (Project Manager; PIEVC Protocol Advisor; Subject Matter Expert)
Client: Ontario First Nations Technical Services Corporation - OFNTSC
The Mohawk territory of Akwesasne is jurisdictionally unique in that the Akwesasne Territory includes portions that are in Ontario and Quebec within Canada and in New York State of the United States of America. No other First Nation community in Canada has these unique jurisdictions and geographic features.
The Mohawk Council of Akwesasne (MCA) operates the Community's water and wastewater system to service the population of three districts. As many other communities in Canada, Akwesasne is not immune to extreme weather and climate uncertainty, and has experienced meteorological events that have caused service disruptions and damage to its infrastructure.
In this project, the water and wastewater infrastructure of the Mohawk Council of Akwesasne community was assessed for vulnerabilities and risks to extreme weather events and projected climate changes. Engineers Canada's PIEVC Protocol was used as the risk assessment tool.

Climate Change Impacts on Four Bridges in Honduras* (Project Manager; PIEVC Protocol Advisor; Subject Matter Expert)
Client: Engineers Canada - Funding from the Government of Canada
This CAD $750K project was aimed at developing the capacity of Honduras engineers in using Engineers Canada's PIEVC Protocol through the vulnerability assessment of four bridges representing various design and construction methods, and geographical and climatic areas in the country. As Project Manager, hired and managed the day-to-day activities and reporting of the Honduras engineering team, provided financial, accounting and technical progress reports, and managed the Canadian Advisory Team providing support to their Honduras counterparts. The project outcomes exceeded the client's expectation. In addition, due to communications and translation streamlining, savings accomplished were used to develop training and educational material offered online at a later date.

** denotes projects completed with other firms*

Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

Combined Sewer Infrastructure Climate Change Vulnerability Assessment* (PIEVC Protocol Advisor)
Client: City of Montreal
Provided guidance and support to the City of Montreal team conducting the vulnerability assessment to climate change of the city's combined sewers system. The City used Engineers Canada's PIEVC Protocol for this study which resulted in land use planning, operations and engineering risk mitigation recommendations that were included in Montreal's climate change adaptation plan.

Development of the PIEVC Protocol Primer* (Author)
Client: Engineers Canada
This project involves the creation of the content of a PIEVC Protocol Primer - Planning an Infrastructure Climate Risk/Vulnerability Assessment using the PIEVC Protocol, a stand-alone document that describes the Protocol, its flexible methodology, types of infrastructures and facilities it can and has been used, its use as a high level or comprehensive level screening tool and the benefits of its application.

Climate Change Assessments
Climate vulnerability assessment of the Flood Protection System of the City of Delta (BC), Delta, British Columbia (Project Manager; PIEVC process specialist; subject matter expert)
Client: City of Delta
The City of Delta (BC) is exposed to flooding from three sources: Fraser River freshet, high intensity rainstorms (short and long duration) and a combination of storm surges with high winds. Delta's dikes surround the entire lowland area, protecting the community from high water levels along the Fraser River, the Strait of Georgia and Boundary Bay. The dike system consists of more than 61 kilometres of river bank dikes and sea dikes. The river dikes protect areas adjacent to the Fraser River from flooding that may occur from high tides, storm surge or flood flows. Sea dikes and seawalls provide protection from high tides, storm surge, waves and debris

** denotes projects completed with other firms*

Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

Climate Change Vulnerability Assessments of Surface and Air Transportation Assets and Infrastructure in Canada, Various, Manitoba, New Brunswick, Nova Scotia, Yukon (Climate Change Specialist; Subject Matter Expert)
Client: Provincial/Territorial Governments and Airport Authorities
As part of the application to the National Trade Corridors Fund, these projects involved the evaluation of the exposure, vulnerability and risks to the surface and air infrastructure and assets at various locations in Canada: Northern, Central and Atlantic. Based on climate trends and future projections, and past climate events that impacted the operations, functionality or structural integrity of the assets, the analysis established key risks that are used to inform the design and life-cycle operations. The work involved the assessment of three airport expansions, the reconstruction of an airport, and various segments of highway infrastructure.

Climate change vulnerability assessment of the Nimboyores water supply system in Costa Rica, Liberia, Guanacaste, Costa Rica (PIEVC Advisor; Subject Matter Expert)
Client: Engineers Canada
The current project conducted by Engineers Costa Rica (Spanish acronym CFIA) in partnership with Engineers Canada and funded by the UN Adaptation Fund is aimed at assessing the climate change risks to a new water supply system (under construction) and existing 14 local distribution systems. The area has experienced rapid resort development and increased tourism that puts stress on the National and regional water utilities to provide drinking and irrigation water.

PRESENTATIONS

Keynote - Managing Assets in the Context of Future “Climate” Uncertainty. *Asset Management BC Annual Conference (Vancouver, BC)*, 2017.

Managing Infrastructure Risks during its Lifecycle. *Canadian Water Network (CWN) Blue Cities conference (Toronto, ON)*, 2018.

Protocolo para la evaluación de riesgos climáticos para infraestructura y su vulnerabilidad. *Tri-Country (Brazil, Peru, Colombia) Public Infrastructure Investment Forum (Brasilia, Brazil)*, 2018.

First Nations Climate Change Infrastructure Vulnerability and Asset Management Toolkit. *Association of Iroquois & Allied Indians Climate Change Symposium (Oneida, ON)*, 2018.

Incorporando el riesgo climático en la planificación, ingeniería, operación y financiamiento de la infraestructura. *Climate change impacts on infrastructure Workshop - January 22/23 (San Jose, Costa Rica)*, 2018.

Vulnerable Infrastructure and the Impacts of Climate Change. *Insurance and Risk Forum (Toronto, ON)*, 2017.

The Need for Infrastructure Climate Risk Assessment . *Inter-American Development Bank (IADB) Canada Outreach Day (Washington, DC)*, 2017.

Evaluación de riesgos en infraestructura: el Protocolo de Ingeniería PIEVC. *PPP Americas (San Jose, Costa Rica)*, 2017.

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Dr. Guy Félio PhD., P.Eng., FCSCE, IRP (Climate)

Senior Advisor, Asset Management Solutions and Infrastructure Resilience
32 Years of Experience · Ottawa, Ontario

Climate Change, Infrastructure Resiliency and Asset Management. *Transportation Association of Canada (TAC) Geometric Design Standing Committee (Ottawa, ON)*, 2017.

Climate change vulnerability and risk assessment of Akwesasne water and waste water infrastructure. *Canadian Society for Civil Engineering (CSCE) Annual Conference (Vancouver, BC)*, 2017.

Protocole d'analyse des vulnérabilités des infrastructures et son application récente dans une petite communauté. *Ouranos - Atelier interministériel*
Outils en adaptation aux changements climatiques pour les municipalités (Quebec City, QC), 2017.

** denotes projects completed with other firms*

Arielle Kadoch Eng.

Project Director and Sector Leader Transmission and Distribution Power · 19 Years of Experience

Stantec

Ms. Arielle Kadoch serves as a Sector Leader for Power Transmission and Distribution for Canada East at Stantec. Ms. Kadoch is responsible for leading and developing strategic opportunities and client relationships in Canada and Internationally. She has over 18 years of experience as an electrical engineer. In addition to her role as sector leader and account manager for several distribution and transmission utilities and other clients, Ms. Kadoch is also Project Director for major projects.

She specializes in power systems, LV, MV, HV and EHV substation designs and has extensive multidisciplinary knowledge of wind and solar ground mount technologies. Ms. Kadoch has especially distinguished herself in project management as well as in market and development strategies. Some of her strong attributes include contract negotiations and client relationships.

Over her career, she has participated in the design and direction of several Hydro projects, EPC substations, wind and solar ground mount projects in which she was responsible for the overall project direction, contract negotiations, coordination and integration of all disciplines, stakeholders and interaction with the contractors from preliminary to in servicing projects. Over time, she has developed working methods that have ensured the success of numerous projects and long term client relationships.

EDUCATION

Major in Mathematics, Montreal University, Montreal, Quebec, 1997

Bachelor of Electrical Engineering, École Polytechnique de Montréal, Montreal, Quebec, 2000

REGISTRATIONS

Engineer #L424, Engineers & Geoscientists New Brunswick

Engineer #8309, Engineers Nova Scotia

Engineer #36545, Engineers & Geoscientists British Columbia

Engineer #32001 (2008), Engineers Geoscientists Manitoba

Engineer #04900 (2008), Professional Engineers & Geoscientists of Newfoundland and Labrador

Engineer, Engineers Yukon

Engineer, Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists

Engineer #95557 (2008), Association of Professional Engineers and Geoscientists of Alberta

Engineer #100129960 (2008), Professional Engineers Ontario

Engineer #1203, Association of Professional Engineers of Prince Edward Island

Engineer #28550 (2013), Association of Professional Engineers and Geoscientists of Saskatchewan

Engineer #129167 (2001), Ordre des ingénieurs du Québec

MEMBERSHIPS

Engineer, Association de l'industrie électrique du Québec

** denotes projects completed with other firms*

Arielle Kadoch Eng.

Project Director and Sector Leader Transmission and Distribution Power · 19 Years of Experience

PROJECT EXPERIENCE

Renewable Energy, Hydro

Outardes-4 power station*, Manicouagan, Quebec (Junior Project Engineer), 2003-2004
Client: Hydro-Quebec
Design of wiring layouts, housings, technical specifications and lists of equipment associated with different phases of manufacturing as well as installation of the power station. Preparation of detailed design packages. Elaboration of proposal, schedule and cost estimates.

Maintenance Engineering*, Quebec, Quebec (Project Manager/Project Engineer), 2002-2004
Client: Hydro-Quebec
Rehabilitation of phases 1 and 2 of 15 substations and power stations. Responsible for projects related to telemetry, consisting of the modification of the billing system of a dozen power stations or substations. Preparation of detailed design package.

Papineauville substation*, Gatineau, Quebec (Project Manager), 2009
Client: Hydro-Quebec
Responsible for the design of diagrams and engineering for the replacement of protection.

Carillon power station*, Quebec, Canada (Project Engineer)
Client: Hydro-Québec
Modification of the protection of generators. Modification of lists, panels and protection diagrams. Preparation of detailed design package.

Bersimis-1 power station*, Manicouagan, Canada (Project engineer), 2001-2002
Client: Hydro-Quebec
Rehabilitation of generators 11 to 14 and 15 to 18. Timing of trips, addition of timers, design of wiring layouts, lists and drawings. Preparation of detailed design package.

Robert Bourassa power station*, James Bay, Canada (Project Engineer), 2001
Client: Hydro-Quebec
Optimization of control equipment. Design of wiring layouts, lists and drawings for supply and installation of panels and equipment.

École de technologie supérieure (Telecommunications)*, Montreal, Canada, 2000
Projects carried out with professors and project managers of École de technologie supérieure. Projects in telecommunications relating to the analysis of networks and IP protocols.

Lafontaine substation*, Quebec, Quebec (Project Engineer), 2007
Client: Hydro-Quebec
Installation of push-buttons reserved for warning and telephone.

Némiscau substation*, James Bay, Canada (Project Engineer), 2005
Client: Hydro-Quebec
Responsible for the engineering and complete design of the 69 kV substation. Control and protection of the 315 kV and 735 kV substations.

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Manic power station (Connexim)*, Manicouagan, Quebec (Junior Project Engineer), 2003
Client: Hydro-Quebec
Telecommunications projects in Hydro-Quebec's sector. Preparation of drawings, estimates, technical surveys and tender calls. Preparation of detailed design package.

Des Sources substation*, Dollard-des-Ormeaux, Quebec (Project Engineer), 2006
Client: Hydro-Quebec
Replacement of the annunciator.

Viger substation*, Montreal, Quebec (Project Engineer), 2008
Client: Hydro-Quebec
Complete engineering design for the rehabilitation of the substation.

Notre-Dame Substation*, Montreal, Québec (Project Engineer), 2009
Client: Hydro-Quebec
Design of diagrams and complete engineering for the replacement of a condenser battery.

La Tuque power station*, La Tuque, Canada (Project Engineer), 2005-2008
Client: Hydro-Quebec
Responsible for Power station rehabilitation, phase 2. Design and engineering of instrument cabinets for groups A2, A4 and A6 (installation of VM600 housings). Design of diagrams (speed regulator, excitation, etc.) and of the station's wiring layouts. Responsible for preparation of detailed project documentation and detailed design.

Power Transmission & Distribution
Hydro-Hawkesbury, Ontario, Ontario (Clients internal representative and Advisor), 2016-present
Contract elaboration, request for proposal and bid evaluation and contractor selection.

Bipole 3 500 KV HVDC Project (Project Manager), 2014-present
Client: Mortenson Construction
Project development and Proposal Lead, Client account respresentative. Responsible for the project direction and contract administration.

Cochrane and Longlake 40 MW Solar, Ontario, Ontario (Project Manager), 2014-present
Client: H.B. White Canada Corp.
Responsible for the management and coordination of all disciplines involved. Client representative, cost and schedule control, project estimations and porposal, etc.

Majestic and Meyer, Clarington and Trout Creek Wind Projects, Ontario, Ontario (Project Manager), 2014-present
Client: Leader Ressources
Responsible for the management and coordination of all disciplines involved. Client representative, cost and schedule control, project estimations, etc.

St Columban Wind Farm, Ontario, Ontario (Project Manager), 2013-2016
Client: Mortenson Construction
Responsible for the management and coordination of all disciplines involved. Client representative, cost and schedule control, project estimations, etc.

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Dufferin Wind Power, Ontario, Ontario (Project Manager), 2013-presnet
Client: Mortenson Construction
Responsible for the management and coordination of all disciplines involved. Client representative, cost and schedule control, project estimations, etc.

Northland Power-9 (10 MW) solar farms, Ontario, Ontario (Project Manager), 2012-present
Client: AECON
Estimations-responsible for the management and coordination of all disciplines involved. Client representative, cost and schedule control.

Hydro-One, Ontario, Ontario (Account manager and client representative), 2010-present
Responsible for the engineering, the management and the coordination of all disciplines for Hydro-One projects. Such as breaker replacement program, transformer replacement, DG distribution and station service upgrade projects. Elaboration of proposals outlining conceptional design schedules and cost estimation.

Hydro-Ottawa, Ottawa, Ontario, 2014-present
Account Manager responsible for the engineering coordination and cost of Letreim, Epworth and Longfield transformers and related equipment replacement projects.

Hydro-Ottawa, Ottawa, Ontario (Account and project manager), 2011-present
Responsible for the engineering coordination and cost of Barrhaven transformers replacement project.

Hydro-Ottawa*, Ottawa, Ontario (Project Manager), 2008
Responsible for the engineering and costs of the Bayswater and Marchwood projects.

De l'Érable wind farm*, Chaudière-Appalaches, Quebec (Project manager), 2009
Client: Éolien de l'Érable
Coordinator and project manager for all disciplines involved in the project (control and protection, civil, instrumentation, etc.). Elaboration of proposals outlining conception design schedules and cost estimation.

Fortis Ontario - Sherkston Substation*, Toronto, Ontario (Project Manager), 2008-2009
Client: Fortis Ontario
Responsible for technical coordination of the project, as well as costs.

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Daniel Hegg B.Comm, MSc, LEED Green Associate, CEM, ENV-SP Verifier

Carbon Mitigation and Climate Resilience Specialist · 14 Years of Experience · Victoria, British Columbia

Stantec

Living on Canada's west coast has deepened Daniel's passion for the development and implementation of sustainable practices. His unique perspectives and insights cross many important areas such as sustainable asset management, strategic energy and water management, sustainable ROI business case development, full value accounting, climate change infrastructure risk assessment for the private and public sectors. In addition to providing strategy and policy advice, Daniel has specialized expertise in climate change adaption planning. Daniel utilizes a modified risk assessment framework designed to align with ISO 31010 Risk Management Standard and the PIEVC Engineering Protocol to assess various assets and their exposure to climate change risks and hazards, determine priority areas, and develop short/medium/long term strategies to build natural and engineering resilience. Dan has prepared multiple climate resilience strategies across a variety of sectors including buildings/real-estate, forestry, oil & gas, renewable energy, and mining. Much of his work has directly helped guide various private and public sector organizations in sustainability and climate action decision-making. Having working on over 130 organizational and facility GHG inventories and offset projects across a wide range of industry sectors, and on numerous GHG mitigation and energy reduction plans, Daniel has proven expertise in climate change mitigation action planning and GHG emissions reductions at the community wide and municipal/corporate planning contexts.

EDUCATION

Carbon Finance Certificate, University of Toronto, Toronto, Ontario, 2010

Master of Science, Faculty of Geography, University of Victoria, Victoria, British Columbia, 2009

Bachelor of Commerce Degree, Faculty of Business, University of Victoria, Victoria, British Columbia, 2006

MEMBERSHIPS

Envision ISI Sustainable Infrastructure Accredited Professional & Verifier, Institute for Sustainable Infrastructure

ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions, Canadian Standards Association

Accredited Total Sustainable Mining (TSM) Verifier, Mining Association of Canada

Leadership in Energy and Environmental Design (LEED™) Green Associate, Canada Green Building Council

Certified Energy Manager (CEM), Association of Energy Engineers

PROJECT EXPERIENCE

Climate Change

Strategic Climate Action Advisory Services (Senior Advisor)
Client: City of Victoria
The purpose of the project was to prepare a climate leadership plan for the City of Victoria. The objective of the plan was to describe a roadmap for the City to follow to achieve a 100% renewable energy target and 80% reduction in GHG emission target by 2050. The work entailed working with staff and stakeholders to develop a community-wide vision, end-state targets, goals, actions, and a set of indicators for monitoring progress towards achieving the vision. Established a methodology, oversaw execution of deliverables, and designed consultation events and a design charrette with the community, stakeholders, and various project

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Carbon Mitigation and Climate Resilience Specialist · 14 Years of Experience · Victoria, British Columbia

committees.

Strategic Climate Change Planning (Senior Advisor)
Client: Municipal Climate Change Action Centre
Assisted the Alberta Urban Municipalities Association (AUMA) and the Municipal Climate Change Action Centre (MCCAC) in developing new programs and capacity-building initiatives that enable municipalities in Alberta to increase energy efficiency, reduce greenhouse gas (GHG) emissions, and adapt to climate change.

Strategic Climate Action Advisory Services (Senior Advisor)
Client: City of Louisville
The purpose of the project was to prepare a community energy and GHG emissions plan for the County. The objective of the plan is to describe a roadmap for the county to follow to reduce its GHG emissions. The work entailed working with staff and stakeholders to develop a community-wide vision, end-state GHG targets, and supporting goals, actions, and a set of indicators for monitoring progress towards achieving the vision. Established a methodology, oversaw execution of deliverables, and designed consultation events and a design charrette with the community, stakeholders, and various project committees.

Strategic Climate Action Advisory Services (Senior Advisor)
Client: City of St. Albert
The purpose of this project was to assist the City understand the options for mitigating their annual GHG emissions through carbon offsets, renewable energy certificates (REC), etc.. A portfolio type approach was recommended to meet requirements, reduce risk and exposure whilst meeting the needs of the City's Climate Action Plan. The work consisted of assessing the technical validity of investing in various technologies, such as solar, purchasing renewables energy credits (REC), and deploying carbon mitigation projects that generate carbon offsets using current carbon pricing and a social cost of carbon.

Due Diligence Transaction Support (Project Lead)
Client: BC Ministry of Environment, Climate Investment Branch
Assisted the BC Ministry of Environment, Climate Investment Branch (CIB) with the due diligence of their 2014/15 carbon offset portfolio. Role also included the revamping of their due diligence technical and financial related processes as it relates to carbon offsets and the development of staff training materials on carbon offsets.

Carbon Supply Analysis (Project Lead and Primary Author)
Client: District of Saanich
Lead author of a carbon offset supply analysis for a residential heating oil replacement project located in Victoria, British Columbia.

Sustainability Framework Development and Reporting (Project Lead / Senior Advisor)
Client: Nexteer Automotive
Assisted with the preparation of a Sustainability Framework as part of the release of Nexteer's first Sustainability Report. The process began with a materiality assessment which identified material aspects that identified what material aspects that currently matter most to Nexteer and its key stakeholders. Using a combination of desktop reviews, interviews, and assessments, the materiality assessment resulted in a short list of relevant (material) aspects that were used to inform the long-term sustainability vision and goals for each material aspect. This process informed

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the development of the Sustainability Framework. which established sustainability related focus areas, goals, and targets for the organization. Daniel now assists with the annual sustainability reporting for Nexteer.

Carbon Supply Analysis (Primary Author)
Client: Nexen
Lead author of a comprehensive carbon offset supply analysis up to 2023. Strategic advice regarding the participation in the carbon and emission trading markets was also provided.

Carbon Disclosure Reporting (CDP) Support (Project Lead)
Client: Nexteer Automotive
The main objective of the project was to advise and assist Nexteer with the 2014 CDP Supply Chain questionnaire with the objective of improving the 2014 score. This included offering expert advice to support the CDP disclosure process and undertaking a standardized 'CDP Response Check' to improve the completeness of Nexteer's submission. The secondary objective of the project was to complete and document a gap analysis to identify where improvements could be made (e.g., GHG data collection and preparation) to improve CDP reporting scores for future years.

Building Energy & Water Assessment (Senior Advisor)
Client: City of St. Albert
Stantec Consulting Ltd. was retained by the City of St. Albert to conduct a detailed energy and water assessment of 11 City owned facilities. The detailed energy and water assessment consisted four phases: a facility baseline utility analysis, on-site facility assessments and City staff interviews, ECM identification and detailed analysis, and reporting on the analysis.

Carbon Offset Liability Assessment, Alberta (Senior Advisor)
Client: Connacher Oil & Gas Ltd.
Stantec was engaged by Connacher to complete a high level analysis of the carbon liability associated with the expansion of their oil and gas facilities in Alberta. Provided recommendations on the most cost-effective compliance path forward.

Carbon Scenario Liability Planning, New Brunswick (Senior Advisor)
Client: Irving Oil
The objective of the work was to provide commentary on the scenarios developed by Irving Oil, present alternate scenarios (as applicable), and provide recommendations for next steps. It should be noted that there are likely other policy design considerations related to each potential scenario reviewed that are not discussed herein, and a variety of other hybrids that could be considered viable. Each scenario has inherent risk due to variety of unknown factors (such as assumptions on future policy direction from other provinces and the federal government).

Climate Change Emissions Management Corporation (CCEMC) Funding-based Project Application (Project Lead)
Client: Suncor Energy Inc.
Prepare a Climate Change and Emissions Management Corporation (CCEMC) compliant project plan. The project plan will describe and quantify estimated GHG emission reductions through the generation of electricity from a 3MW photovoltaic (PV) solar installation (the project) co-located at the Suncor Wintering Hills Wind Power Facility, near Drumheller, Alberta. The objective of the preparation of the project plan is to document and predict greenhouse gas (GHG) emission reductions from the project thus enabling CCEMC to complete its due diligence assessment as part

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of the CCEMC funding application process.

Climate Change Emissions Management Corporation (CCEMC) Funding-based Project Application (Senior Advisor)
Client: MAXIM Power
Prepared two $25 million dollar CCEMC applications for the greening of a 144 MW coal-fired power plant through the implementation of cogeneration and biomass waste projects.Strategic Climate Change & GHG Planning,

Climate & Environmental Impact Assessment (Technical Lead)
Client: Petronas
Provided environmental consultation services in accordance with Canadian Environmental Assessment Agency (CEAA) requirements with a specific focus on quantifying GHG emissions over the projects life and assessing the effects that the climate change would have on the project. The project is a natural gas liquefaction facility.

Climate Change Adaptation Risk Assessment Framework (Project Team Member)
Client: Nova Scotia Environment
Responsible for contributing to the development of a climate change adaption risk assessment and planning framework. The project involved marrying climate change adaptation planning and socio-economic scenario planning to create a robust climate change adaption framework for the Ministry that could be applied at the various scales.

Prince Rupert Gas Transmission (PRGT) Project, British Columbia (Technical Lead)
Client: TransCanada
Provided environmental consultation services in accordance with Canadian Environmental Assessment Agency (CEAA) requirements with a specific focus on quantifying GHG emissions over the projects life and assessing the effects that the climate change would have on the project. Developed GHG emissions management plan to co-inside with EA application for proposed pipeline facility.

National Municipal Solid Waste (MSW) GHG Calculator (Project Lead)
Client: Environment and Climate Change Canada (ECCC)
The project was to assess whether the Municipal Solid Waste (MSW) disposal component of the ECCC Greenhouse Gas (GHG) Emissions Model for Waste resulted in reasonably accurate GHG estimates. The scope of work specifically focused on the whether the MSW disposal assumptions and supporting data are transparently and efficiently presented, and utilizes the best available information. Although the MSW, incineration and wastewater GHG emissions estimates are not linked methodologically, common data in each fed into each of the GHG calculators contained within the Model.

Climate Change Regulatory Scan and Impact Assessment (Senior Advisor - Risk)
Client: Occidental Petroleum Corporation
Researched and assessed all local, state, and federal environmental air, climate, and energy regulations with the potential to impact operations.

Climate Change Adaptation Risk Assessment Framework, USA (Senior Technical Advisor - Risk)
Client: AmTrack
Stantec completed a pilot study focusing on a 10 mile section of track within the Wilmington, Delaware Area. As part of this Pilot Study, a climate change framework was developed and considers various resources including the FHWA

** denotes projects completed with other firms*

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Climate Change and Extreme Weather Vulnerability Assessment Framework. The main objective of this pilot study is not only to assess Amtrak's asset vulnerabilities within the Pilot Study area, but more importantly, to set up a framework and methodology that can be repeated along other stretches or for the entire NEC. The pilot study provided the foundational knowledge base necessary for similar efforts along the NEC in the future.

Climate Change Adaption Plan (Project Manager and Technical Specialist)
Client: The Corporation of the District of Saanich
Responsible for assisting Saanich staff complete a climate change adaption plan. The work involved engaging with atmospheric scientists, community stakeholders, mitigation and adaptation experts and municipal staff to develop a comprehensive understanding of the risks that climate change poses to the community. Developed a risk assessment framework based upon ISO 31010 and used it to form the adaptation plan. Role also included the oversight and coordination of tasks and activities, including acting as lead researcher and main author of both the plan and support document.

Life Cycle Analysis (Project Lead & Analyst)
Client: Atlantic Industries Limited
Conducted a Lifecycle Analysis (LCA) of stockpile tunnels used in industrial applications (mining) – comparing the aspects and impacts of AIL's SuperCor product to a comparative concrete product offered by a competitor. This work involved the assessment of the broader life cycle aspects associated with each product in order to consider where there were additional environmental and social impacts, and potential analyses and improvements in the near future.

Climate Change Risk Assessment Workshop and Adaptation Plan, Northwest Territories (Project Manager and Advisor - Risk)
Client: Northwest Territories Department of Transportation
Responsible for helping the North West Territories Department of Transportation undertake an assessment of the effects that climate change will have on their department. The project involved climate change adaptation-planning workshops for senior departmental staff, engaging with atmospheric scientists, community stakeholders, mitigation and adaptation experts and municipal staff to develop a comprehensive understanding of the risks that climate change poses to the transportation sector. Developed a risk assessment framework based upon ISO 31010 and used it to inform the adaptation plan. Role included the oversight and coordination of tasks and activities; the development of the risk assessment; and the completion of the adaption plan ensuring that the requirements of the risk assessment framework was adequately met.

Strategic Climate Action Advisory Services (Senior Advisor)
Client: Phillips 66
The purpose of this project was to assist Phillips 66 understand the options for mitigating their annual GHG emissions. A portfolio type approach was recommended to meet requirements, reduce risk and exposure whilst meeting the needs of the local County's Climate Action Plan and other stakeholders. The work consisted of assessing the technical validity of investing in various technologies, such as solar, purchasing renewables energy credits (REC), and deploying carbon mitigation projects that generate carbon offsets using current carbon pricing and a social cost of carbon. Recommendations were made in consideration of Phillips 66's business interests

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and CSR objectives, and the San Luis Obispo County Climate Action Plan.

Carbon Offset Programmatic Guidance Document (Primary Author)
Client: Pacific Carbon Trust
Primary author of a Programmatic of Activities (PoA) Guidance Document designed to supplement the BC carbon market by developing a framework to allow the development and use of programmatic carbon offsets within BC. The document provides project developers and validation and verification bodies (VVB) sufficient guidance on developing and auditing eligible programmatic offsets within the framework of the BC Emission Offsets Regulation (EOR).

Carbon Market Feasibility Assessment (Primary Author)
Client: Federation of Canadian Municipalities (FCM)
Co-authored a detailed report on existing and emerging national, international, and multijurisdictional climate change programs and offset markets. The report identified relevant quantification protocols within established offset systems and provided a framework and process as to how municipal governments in Canada could engage in current offset markets. Report provided FCM with strategic direction and recommendations.

Carbon Market Advisory, British Columbia (Senior Advisor)
Client: Carbon Neutral Kootenays Project Steering Committee
Responsible for contributing to a detailed report that assessed all potential carbon offset development opportunities within the Kootenays. Role was to provide key insights and strategies as it related to generating and selling carbon credits.

Carbon Market Feasibility Assessment (Author)
Client: New Brunswick Climate Change Secretariat
Co-authored a detailed report that assessed all potential carbon offset development opportunities within select New Brunswick government departments and associated programs. Document included a comprehensive review of current and emerging offset systems, current trends, and a detailed assessment of the key considerations that must be considered in developing a carbon offset environment within New Brunswick.

Strategic Carbon Planning: Carbon Markets and Emission Trading (Primary Author)
Client: Bell Alliant
Responsible for providing strategic direction on carbon markets and the assessing the potential costs associated with purchase of carbon offsets and using social cost of carbon as a means to meet internal carbon neutrality goals. Strategic advice regarding the participation in the carbon and emission trading markets was also included.

GHG Validation Guidance Document (Co-Author)
Client: Pacific Carbon Trust
Co-author of a validation guidance document for carbon offset project developers. The document provides guidance to project developers about the validation process, what is required and what can be expected during the validation of offset projects.

Forestry Carbon Offset Protocol (FCOP) Guidance Document and Assessment Program/GCC Carbon Neutral Framework Local Government REDD-Based Protocol/CRD Forest Carbon Case Study (Primary Author)
Client: Union of BC Municipalities (UBCM) and the

Daniel Hegg B.Comm, MSc, LEED Green Associate, CEM, ENV-SP Verifier

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Province of BC Climate Action Secretariat (CAS)
Primary author of a comprehensive guidance document designed to assist local governments in assessing the business case for utilizing forested lands as carbon offset projects. The document includes an overview of forest carbon markets and a useable framework enabling local governments to quickly discern whether they are eligible to deploy FCOP and generate a revenue stream. The document includes a REDD based protocol that will enable local governments to apply measured sequestration value against a local government's corporate carbon liability under the GCC Becoming Carbon Neutral framework. A case study on the Capital Regional District (CRD) business case process for forest carbon offsets is included.

Strategic Carbon Planning: Carbon Markets and Emission Trading (Project Lead and Primary Author)
Client: Total E&P Canada
Lead author of a comprehensive analysis of how carbon markets and emissions trading, and the participation thereof, would impact Total's current interests and its future plans for oil sands development in Canada up to 2020. Strategic advice regarding the participation in the carbon and emission trading markets was also provided.

Strategic Carbon Planning: Project Development (Senior Advisor - Risk & Offset)
Client: Victoria Capital Regional District (CRD)
Trusted advisor retained to assist the CRD in identifying cost effective solutions to generate and/or sell carbon offsets. Role included being the lead author of developing an EOI and RFP on behalf of the CRD to identify and select a consultant to undertake a business case analysis/feasibility assessment regarding the development of an ecosystem-based carbon offset project(s) on the Western Forest Products and/or Leech River Watershed lands. Role also included consultant evaluation and selection as well as provide carbon-market intelligence and strategic advice on an as needed basis to the CRD.

GHG Quantification Assessment Checklist and Standard (Co-Author)
Client: Pacific Carbon Trust
Primary author of a comprehensive Emission Offsets Regulation (EOR) protocol validation checklist and co-author of a supporting protocol standard. Both documents provide both guidance and structure that enables Validation/Verification Bodies (VVB) to assess if GHG quantification protocols can be used to generate eligible offsets within British Columbia.

Low-Income Residential Weatherization Program Guidance Document (Contributing Author and Senior Advisor)
Client: Maine State Housing Authority
Contributing author to a guide on financing residential energy efficiency programs for low-income housing using carbon finance. The document was written primarily to help project developers and investors determine whether or not the new model creates opportunities for their organization. Specifically, it helps these users understand if project development is feasible and, if so, how they can best evaluate, plan, finance and execute such a project.

GHG Management Plan (Project Team Member and Senior Advisor)
Client: BC Transit Corporation
Responsible for drafting strategies and recommendations as it related to green-procurement, green leases and the procurement of carbon offset as a means to meet carbon neutral strategic goals. As a result of the report,

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BC Transit has recently developed eligible carbon offsets from their transit fleet as one means to reduce their carbon liability.

GHG Inventory, Targets & Management Plans (Project Lead)
Client: Multiple Clients
Responsible for preparing a GHG calculator and forecast tool for Scope 1, 2 and 3 emissions using best practice quantification methodologies. (ISO14064-1, The Climate Registry Local Government Protocol, the World Resources Institute General Reporting Protocol, the World Resources Institute Scope 3 Emissions Reporting Protocol, and the Global Protocol for Community (GPC) Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities). Each client was provided a functional MS-Excel based GHG calculator and MS Word based report. Each report included a comparative assessment of the GHG emissions, and recommendations on how GHG emissions could be prioritized and reduced., against a set GHG reduction target. Such services have been provided to the following clients on an annual basis:
* District of Mission
* Regional District of Nanaimo
* Victoria Capital Regional District (CRD)
* Mohawk College
* Humber College
* BC Government & Employee Services Union (BCGEU)
* City of St. Albert
* District of Saanich
* Carbon Neutral Kootenays
* District of Central Saanich
* Town of Sidney
* City of Edmonton
* City of Grand Prairie
* City of Victoria
* District of Saanich
* City of Louisville

GHG Inventory: Forecasting and Reduction Measures (Project Team Member)
Client: Regional District of Nanaimo
Responsible for developing GHG inventories for each electoral area and business-as-usual forecasts for milestone years up to 2036. Role also included drafting strategies and recommendations related to green initiatives, GHG/energy reduction measures and the purchase of carbon offsets.

Carbon Credit/Project Transaction Support (Project Lead and Senior Advisor)
Client: Multiple Clients
Developed and utilized a due diligence framework that aligned with ISO 14064 standards which set out the detailed criteria to which a conclusion as to whether credits to be purchased would be of adequate quality as to not pose a commercial or reputation risk to the buyer/investor. Provided an in depth report to each client summarizing the process followed, finding and recommendations. Such services were provided to the following clients:
• Nova Chemicals–Biological Sequestration Carbon Credit Projects (4 separate projects)
• TimberWest–Forestry Carbon Credit Project
• Ecosystem Restoration Associates–Forestry Carbon Credit Project
• TransCanada–Biological Sequestration Carbon Credit Projects (3 separate projects)

SGER Audits, Alberta (Project Manager/Verifier)
Client: Alberta Environment (AENV)
Lead verifier and project manager of six (6) SGER facility audits. Re-visited SGER Compliance Reports GHG assertions for a pulp mill and biomass facility in AB. Role included checking

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boundaries, sinks and sources; observe, capture and calculation of data; collect root data and perform on-site re-calculations; assess data management systems; interview site personnel and assess evidence to provide an audit opinion to Alberta Environment (AENV).

Carbon Offset GHG Validation and Verification (Lead Validator / Verifier and Project Manager)
Client: Multiple Clients
Lead validator/verifier and project manager of multiple carbon credit projects within Alberta and British Columbia. Validation activities included assessing audit risk, testing and analyzing financial additionally, attending the site visit and completing the validation to a financial level of assurance. Verification activities included undertaking a risk analysis, developing working papers, a sampling plan, and completing the verification to a financial level of assurance. Such services were provided to the following clients:
* Alberta Environment (Validation of waste-to-energy baseline in AB), 2014
* Spectra Energy (Validation of pipeline blowdown projects in BC), 2011
* Blue Source Canada (Validation of pipeline electrification projects in BC), 2010
* Blue Source Canada (Validation of a POA engine fuel gas management project in BC), 2013
* Alliance Pipeline (Validation of waste heat recovery project in AB), 2010
* Carbon Credit Corporation/ Great Bear Rainforest Initiative (Validation of improved forestry management projects in BC), 2011, 2012, 2013
* Brinkman Forest Systems Inc. (Validation of improved forestry management project in BC), 2014
* Offsetters Clean Technology (Validation of a Program of Activities Protocol (PoA) applicable to energy efficiency improvements made to heavy-duty trucks and mobile equipment under the VCS), 2012
* LEAP (Validation of a Project applicable to low income residential weatherization under the VCS), 2013
* Offsetters Clean Technology (Validation of two greenhouse fuel-switching projects in BC), 2010
* Offsetters Clean Technology (Valid

Single Facility GHG Verification (Project Manager/Verifier)
Client: Multiple Clients
Lead verifier and project manager of various facility audits. Work consisted of the verification of multiple facilities required to report emissions under the Alberta Environmental Specified Gas Emitters Regulation (SGER) and/or The Climate Registry. Verification activities included undertaking a risk analysis, developing working papers, a sampling plan, completing the verification to a financial level of assurance and drafting a final verification report for submission. Such services were provided to the following clients:
• TransAlta (5 facilities), 2015, 2016
• Teck Coal Ltd. (multiple years)
• Weyerhaeuser Inc.
• Nexen Inc. (multiple years)
• Devon Canada. (multiple years)
• TransCanada (multiple years)
• Lehigh Cement Inc.
• Dow Chemicals
• Confidential US Power Generation Company (generation included hydro, coal fired and nuclear)

Linear Oil and Gas Facility GHG Verification (Project Manager/Verifier)
Client: Multiple Clients
Lead verifier and project manager of linear oil and gas facility audits. Work consisted of the verification of multiple oil and gas linear facilities

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required to report their GHG emissions under the British Columbia Emissions Reporting Regulation. Verification activities included undertaking a risk analysis, developing working papers, a sampling plan, and completing the verification to a financial level of assurance. Such services are provided to the following clients on an annual basis:
* Harvest Energy (2010-2015)
* Imperial Oil (2015, 2016)
* ConocoPhillips (2015, 2016)
* Progress Energy (2015, 2016)
* Enerplus (2010-2015)
* Devon Canada Corporation (2010-2015)
* Nexen Inc. (2010-2015)
* Penn West Exploration Ltd. (2010-2015)
* Bonavista (2015)
* Encana (2016)
* Spectra (2016)
* Centrica Energy (2016)
* Pengrowth (2016)
* Painted Pony Petroleum (2015)
* PetroBakken Energy Inc. (2010)
* Chinook Energy Inc. (2010)
* EOG Resources Inc. (2013-2015)

GHG Quantification Protocol Assessment (Project Manager/Validator)
Client: The Carbon Solution
Lead validator and project manager of a GHG Quantification Protocol Assessment. Role was to lead the validation of a behavioral modal switching protocol. The protocol validation is acceptable to projects where individuals switch from fossil fuel based transportation to active forms of transportation, such as walking or bicycling. The work included assessing the Protocol for adherence with ISO 14064-2, the British Columbian Emission Offset Regulation, the Pacific Carbon Trust (PCT) guidance documents, and assessing the clarity, completeness, structure and logic of the protocol in the context of that Regulation and industry practices.

GHG Quantification Protocol Assessment (Project Manager/Validator)
Client: Offsetters Clean Technology
Lead validator and project manager of a GHG Quantification Protocol Assessment. Role was to lead the validation of a Program of Activities Protocol (PoA) applicable to energy efficiency improvements made to heavy-duty trucks and mobile equipment. The work included assessing the Protocol for adherence with ISO 14064-2, the British Columbian Emission Offset Regulation, the Pacific Carbon Trust (PCT) guidance documents, and assessing the clarity, completeness, structure and logic of the protocol in the context of that Regulation and industry practices.

Economic Impact Analysis
Sustainable Return on Investment Yard Waste Program Assessment (Senior Advisor)
Client: City of Victoria
Prepared a Sustainable Return on Investment analysis to evaluate, and analyze options for organics management in the City. Developed the methodology and worked with staff to complete the analysis.

Full Value Accounting of an Urban Watershed (Author)
Client: University of Victoria
Lead author of a detailed report on the triple bottom line assessment of the Swan Lake Watershed in Victoria, BC. Role included conducting research on topics related to the financial valuation of ecosystems, urban ecosystem health, and urban planning and community adaptation and mitigation strategies. Project focused on how ecosystem valuation methods and the measurement of ecosystem health could be utilized together in urban

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development planning as an urban planning risk reduction strategy for climate change.

Triple Bottom Line Indicator Development (Senior Advisor)
Client: City of St. Albert
Prepared "Triple Bottom Line" (TBL) cost benefit indicators and analysis that takes into consideration the financial, environmental, and social (reputation) impacts of the City of St. Albert's energy efficiency efforts.

Triple Bottom Line Assessment of Engineered Wetlands (Co-Author)
Client: The Corporation of the District of Saanich and the Federation of Canadian Municipalities (FCM)
Co-authored a detailed a triple bottom line cost-benefit analysis of five projects that applied nature's design principles in the design of storm water management and compared their overall value to that of traditional "pipe and drain" approaches. Conducted research on topics related to the financial valuation of ecosystems, participated in interviews, financial data collection and analysis. Report included management recommendations.

Financial Auditor (Project Team Member)
Responsible for examining and auditing various components of the financial statements of publicly traded and private organizations. Role was to ensure that the records reflect the true financial state of the business and that the procedures employed are correct.

Green Infrastructure Design
Development of Environmental Indicators, British Columbia (Senior Advisor)
Prepared objectives, indicators and policies related to reducing GHG emissions as part of an Official Community Plan (OCP).

Low Level Road Project Envision Sustainable Infrastructure Rating Assessment (Climate Risk Assessor)
Client: Port of Metro Vancouver
Responsible for assessing the project's sustainable performance using the Envision™ Sustainable Infrastructure Framework and Rating System. Focus was on assessing the risks associated with climate change as well as GHG emissions for the Project. This project is targeting Envision™ Gold certification.

LEED Review (Senior Advisor & Lead Author)
Client: City of St. Albert
Stantec Consulting Ltd. (Stantec) was retained by the City of St. Albert (the City) to perform a review of the estimated cost premium for LEED®-certified buildings, and to assess the benefits of building to sustainable standards (e.g., building "green"). The objective of the review was to provide an assessment of what building "green" in the future may mean to the City in the context of a new Alberta Energy Code (i.e., the National Energy Code of Canada for Buildings (NECB) 2011)and the recent update to the LEED® rating system (i.e., version 4). The analysis of the City's Fire Station No. 3 was included as a "lessons learned" style case study to bridge the difference between the building's performance and costs, and more recent evaluations of costs/benefits of LEED® buildings.

Environmental and Urban Planning Consulting Services (Project Team Member)
Client: Multiple Clients
Responsible for the following tasks:
• Provided onsite environmental monitoring and construction management advice for LEED urban development projects

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• Completed Riparian Area Assessments (RAA)
• Participated as part of an integrated team in urban community design charettes and OCP development
• Participated as part of a multidisciplinary team in the Proper Functioning Condition (PFC) assessments of aquatic ecosystems

Financial Auditor (Project Team Member)
Client: Multiple Clients
Responsible for examining and auditing various components of the financial statements of publicly traded and private organizations. Role was to ensure that the records reflect the true financial state of the business and that the procedures employed are correct.

Stormwater Quality Assessment Study (Project Team Member)
Client: The Corporation of the District of Saanich
Responsible for researching how point and non-point source pollution affects freshwater ecology and urban stream rehabilitation, water quality testing, and project management. The purpose of the work was to study an urban watershed by collecting water and sediment samples over a period of one year in order to assess the performance of engineered urban wetlands within an urban setting. Role included the collection of water and sediment samples to test for metals, chemicals and biological levels. Role also included the preparation of a detailed report of which provided management recommendations.

Integrated Stormwater Management Plan (Primary Researcher)
Client: The Corporation of the District of Saanich
Responsible for conducting water quality sampling, and assisting with hydrological assessments. Role also included providing management recommendations and participating in stakeholder engagement education and data collection programs.

Urban Development Receivership Services (Project Team Member)
Client: Confidential Client
Responsible for providing assistance to a court appointed receiver by performing duties including: due diligence; developing financial construction budget forecasts to assess the value of the development; and managing the property to ensure that it remained LEED compliant.

Green Building Feasibility Assessment (Project Lead)
Client: The Corporation of the District of Saanich
Conducted a green building assessment of Saanich Municipal Hall to establish a baseline to which the impact of future greening activities can be measured against. This included preparing a green building a certification readiness check for LEED EB:O&M 2009 and BOMA BESt Version 2.0 as well as to provide recommendations in a short report.

LEED EBOM Credit Assessment (Project Lead)
Client: Intact and BP Centre
Prepared documentation of renewable energy, GHG emissions and waste program credits/prerequisites for a three tower commercial building for LEED certification.

Official Community Plan (Project Team Member)
Client: Village of Cumberland
Prepared objectives, indicators and policies related to reducing GHG emissions, increasing energy conservation and efficiency measures and building adaptive capacity to prepare for a changing climate.

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Energy Mapping and Assessment (Project Lead & Senior Review)
Client: District of North Cowichan
Sustainability policy formulation, energy mapping coordination and development of indices for monitoring GHG reduction (as part of BC Hydro requirements).

PUBLICATIONS

Advancing the Practice - ASCE Library. Evaluating Community Transportation Emission Methodologies. Green Streets, Highways and Development 2013, 2013.

Air & Waste Management Association Feature Article. The Future Is Not What It Used To Be: Preparing For Climate Change., 2013.

University of Victoria. Valuing Ecological Services and Community Design - Implications for the Private Market and Local Government, 2009.

Canada Mortgage and Housing Corporation. Nature's Revenue Streams: Five Ecological Value Case Studies, 2008.

** denotes projects completed with other firms*

Christina Varner P.Eng.

Air Quality Engineer · 11 Years of Experience · Fredericton, New Brunswick

Stantec

Ms. Varner obtained a Bachelor of Science in Engineering (Chemical) from the University of New Brunswick. She has completed desktop reviews, reporting, and conducted site visits for facility and project GHG inventories under Alberta Specified Gas Emitters Regulation (SGER), the British Columbia Emissions Offset Regulation and Reporting Regulation, The Climate Registry, Verified Carbon Standard (VCS), the Ontario Environmental Protection Act 452/09, and the Massachusetts Mandatory Greenhouse Gas Reporting Regulation. Ms. Varner has completed the ISO 14064-3 GHG verification training course. She has been identified as a lead validator/verifier at Stantec. She has also been involved in air quality studies including dispersion modelling, noise monitoring, source emissions testing, and ambient air quality monitoring. These projects have been across a number of industrial sectors, including pulp and paper, petroleum refinement, electricity generation, and asphalt production. Ms. Varner has created various emissions inventories to address regulatory requirements and permitting including National Pollutant Release Inventory (NPRI), Environment Canada Greenhouse Gas (GHG) reporting, and to support environmental impact assessments.

EDUCATION

Bachelor of Science in Engineering (Chemical), University of New Brunswick, Fredericton, NB, 2008

Canadian Standards Association, Greenhouse Gas Verification Using ISO 14064, Fredericton, New Brunswick, 2009

Enform, H2S Alive, Fredericton, New Brunswick, 2011

MEMBERSHIPS

Member, Engineers & Geoscientists New Brunswick

PROJECT EXPERIENCE

Offset Project Greenhouse Gas (GHG) Verification

Specified Gas Emitters Regulation, GHG Offset Verification (Verifier), 2011-2013

Client: Multiple Clients

Christina completed the desktop review of GHG emissions offset reports for various projects in Alberta. The desktop review included evaluating the GHG data supporting the report as well as the data quality assurance/quality control practices employed at the project. Christina developed the verification plan and verification report. Such services were provided to the following clients:

- Suncor Wintering Hills, Chin Chute and Magrath Wind Power Projects (2011-2012)
- TransAlta Wind Power Projects (5) (2013)
- Verdant Energy Dapp Power Electric Generating Facility Project (2013)

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Christina Varner P.Eng.

Air Quality Engineer · 11 Years of Experience · Fredericton, New Brunswick

Facility Greenhouse Gas (GHG) Verification

Ontario 452/09 Regulation GHG Verification, Ontario (Verifier and Lead Verifier), 2011-present
Client: Multiple Clients
Christina completed the desktop review of GHG emissions reports in Ontario. The desktop review included evaluating the GHG data supporting the report as well as the data quality assurance/quality control practises employed at the facilities. Christina developed the verification plan and verification report. Such services were provided to the following clients:
• Xstrata Copper (now Glencore) Kidd Concentrator (2011-2013)
• Federal White Woodstock Plant (2011-2013)
• Carmeuse Lime Blind River Facility (2012-2013)
• Imperial Oil Nanticoke Refinery (2016)
• Imperial Oil Sarnia Refinery (2016)
• Imperial Oil Sarnia Petrochemical (2016)

Specified Gas Emitters Regulation, GHG Verification (Verifier), 2007-Present
Client: Multiple Clients
Christina completed the desktop review of many oil and gas SGER emissions reports in Alberta. The desktop review included evaluating the GHG data supporting the report as well as the data quality assurance/quality control practises employed at the facilities. Christina developed the verification plan and verification report. Such services were provided to the following clients:
• Alliance Pipeline (2007-2010)
• Devon Canada Wapiti Gas Plant (2009-2010)
• Shell Canada Scotford Refinery (2011 -2012)
• TransCanada Pipeline (2012-2014)
• Syncrude Canada Ltd. (2016)
• Imperial Oil Cold Lake (2016)

British Columbia Reporting Regulation Verification, British Columbia (Verifier and Lead Verifier), 2010-present
Client: Multiple Clients
Christina completed the desktop review of many oil and gas emissions reports in British Columbia. The desktop review included evaluating the GHG data supporting the report as well as the data quality assurance/quality control practises employed at the facilities. Christina developed the verification plan and verification report. For several projects, Christina led the site visit. Such services were provided to the following clients:
• Penn West Linear Facility (2010-2016)
• Enerplus Linear Facility (2010-2011)
• Devon Canada Linear Facility (2010-2011)
• Nexen Linear Facility (2012-2013)
• Imperial Oil Horn River (2016)
• ConocoPhillips (2016)
• Nexen Linear Facility (2016)

Environmental Assessments

BC Hydro Site C Project: Proposed Hydroelectric Dam, Fort St. John, British Columbia (Team Member), 2012
Client: BC Hydro
In support of the environmental assessment, Christina worked with a team of greenhouse gas analysts to quantify emissions of GHGs associated with the Site C Project. Christina focused on developing the construction emissions inventory, which included estimating life cycle emissions of the proposed construction materials and fuels. Christina assisted with the writing of the Greenhouse Gases Technical Report and the environmental impact statement chapter on greenhouse gases.

** denotes projects completed with other firms*

Christina Varner P.Eng.

Air Quality Engineer · 11 Years of Experience · Fredericton, New Brunswick

Project Eider Rock: Proposed Petroleum Refinery and Marine Terminal, Saint John, New Brunswick (Team Member), 2006-2009
Client: Irving Oil Limited
In support of the environmental assessment, Christina worked with the Atmospheric Environment Team on the Air Quality Technical Study. Christina gathered ambient air concentration data for air contaminants from the National Air Pollutants Surveillance (NAPS) network and the New Brunswick Department of Environment, and completed the preliminary statistical analysis. Christina also assisted with developing the Air Quality Technical Study and the Atmospheric Environment chapter in the Environment Assessment report.

Air Emissions Estimation

Pulp Mill National Pollutant Release Inventory, Fredericton, New Brunswick (Data Analyst), 2008-2016
Client: AV Nackawic
Christina developed an emissions inventory for the pulp mill in accordance with the requirements of the National Pollutant Release Inventory.

Source Emissions Testing, Irving Oil Refinery, Saint John, New Brunswick (Data Analyst), 2016
Client: Irving Oil Limited
Christina performed the analyses on source emissions testing data for particulate matter, trace metals, and criteria air contaminants for various oil refinery units to determine emission rates. She conducted the statistical analyses for Relative Accuracy Test Audits on emissions monitors located on certain stacks.

Air Dispersion Modeling

Deersdale Source Contribution Study, Deersdale, New Brunswick (Air Quality Engineer), 2008-2009
Client: J.D. Irving Limited
Christina was responsible for the model input and development of the emissions inventory for the project. She estimated and reported emission rates of particulate matter from various emission sources at a sawmill. An emissions inventory was developed based on these emissions for dispersion modelling. Inventory results were entered into a dispersion model. The model was used to predict ground-level concentrations and source contributions at various locations surrounding the facility. The modelling results were presented in a report to the client.

Noise Assessments

Brunswick Pipeline Horizontal Directional Drilling Noise Assessment, Saint John, New Brunswick (Noise Analyst), 2009
Client: EMERA Brunswick Pipeline
Christina monitored noise data and analyzed it to determine 1-hour and 24-hour equivalent sound pressure levels to ensure compliance against regulatory guidelines.

** denotes projects completed with other firms*

Nicole Flanagan B.A., M.A.Sc., P.Eng

Senior Atmospheric Environments Engineer · 20 Years of Experience · Ottawa, Ontario

Stantec

Nicole Flanagan, M.A.Sc., P.Eng. has 18 years of environmental engineering experience, 14 of which are with Stantec. Nicole specializes in climate change and air emissions across a variety of industrial, government and corporate sectors. She is currently the Canadian Technical Leader for Climate Change and Sustainability. Nicole was the lead verifier of some of the first regulatory greenhouse gas offsets sold in North America, has completed Environmental Compliance Approvals (ECAs), Section 71 Reports and National Pollutant Release Inventory reporting. Her air emission and verification clients have included major electric utilities, energy companies, petrochemical production facilities as well as oil & gas companies. As a subject matter expert, Nicole provides training on the carbon accounting of inventories, emission reduction projects and validation/verification on behalf of the Canadian Standards Association. She is senior technical reviewer for greenhouse emission quantification, reporting and verification, strategic carbon consulting and sustainability. She also spent four years with Environment Canada working on program development and delivery, which included meeting with stakeholders and administering procedural processes. In 2011, Nicole was responsible for managing Canada's UNFCCC National Inventory Report submission. During this time, she developed a strong understanding of the workings of government from a program administration perspective (Greenhouse Gas, NPRI Reporting Division and Canada's Offset System) as well as from regulatory and instrument development (development of GHG regulations and Pollution Prevention Planning requirements).

EDUCATION

M.A.Sc., Civil Engineering (Environmental), University of Ottawa, Ottawa, Ontario, 2001

B.Eng. Civil Engineering, Ryerson Polytechnical University, Toronto, Ontario, 1998

B.A., Queen's University, Kingston, Ontario, 1994

REGISTRATIONS

Professional Engineer, Professional Engineers Ontario

PROJECT EXPERIENCE

Climate Change and Sustainability

Strategic Carbon Consulting, Irving Oil
Assessed the implications of various regulatory options including Cap and Trade and Carbon Tax.

Glencore Canada Corporation (Lead Verifier)
Lead Verifier for 2011, through 2016 reporting years for the Sudbury Integrated Nickel Operations.

Glencore Canada, Lead Verifier for Various Facilities in Ontario
Lead Verifier for Sudbury Integrated Nickel Operations, Onaping Mill and Mines, and Glencore Kidd for a variety of mining, milling and smelter operations.

City of Victoria, City of Edmonton, and Grand Prairie Community GHG Quantification
Senior Reviewer of the GHG Quantification and calculators for the above noted cities, including emission reduction and climate change policies.

City of Cambridge, City of Waterloo Corporate GHG Quantification (Annually since 2012)
Senior Reviewer of the GHG Quantification and calculators for the above noted cities under the Federation of Canadian Municipalities Milestones 1-5 including inventories, energy and climate action planning.

** denotes projects completed with other firms*

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Greenhouse Gas Verification (ISO 14064-3) on Behalf of Canadian Standards Association (Instructor)
Instructor on the ISO 14064 suite of standards training course for verification since 2014.

Greenhouse Gas Offset Emission Reduction Credits, Alberta, 2006-2013
Client: Verdant Energy
Lead Verifier for three audits for a biomass to energy and waste diversion project (2006, 2007, 2013 and 2014).

College Emission Inventory, Mohawk College (Lead Quantifier)
Developed the 2010 Mohawk College GHG Emission Inventory including presenting to various levels of management and community groups. The carbon footprint also included a number of recommendations for reducing the Colleges's Carbon Footprint.

Greenhouse Gas Emission Reporting under O.Reg. 452/09 for Five Facilities Power Plants (Atlantic Power) (Project Manager / Quantifier)
Client: Atlantic Power
Developed emission inventory for five facilities under Ontario's Greenhouse Gas Emission Reporting Regulation and National Pollutant Release Inventory Reporting for natural gas and biomass fueled power plants (2013 to 2016 reporting year).

Greenhouse Gas Verification – Imperial Oil National Portfolio (Reviewer)
Reviewer of a dozen facility GHG verifications for Imperial Oil and associated facilities each of the 2015 and 2016 reporting year.

Greenhouse Gas Emission Report under O.Reg. 452/09 (Lead Verifier) – Canadian Gypsum Company (Lead Verifier)
Client: Canadian Gypsum Company
Lead verifier for gypsum manufacturing facility under Ontario's Greenhouse Gas Emission Reporting Regulation for 2011 through 2016 reporting years.

Greenhouse Gas Emission Report under O.Reg. 452/09 (Lead Verifier) – INEOS Styrolution (Lead Verifier)
Client: Styrolution
Lead verifier for petrochemical production facility under Ontario's Greenhouse Gas Emission Reporting Regulation for 2011 through 2016 reporting years.

Greenhouse Gas Emissions Quantification (Senior Reviewer - Emissions Reporting)
Senior technical review of Emissions Reporting (SGER, BC Reporting), NPRI, CAPP Stewardship, and Chemical Management Plans reporting requirements for various upstream oil and gas clients. Clients include:
- Connacher
- Rife Resources
- Baytex Energy Trust
- TORC Oil
- Journey Energy
- TAQA North

Greenhouse Gas Reporting (British Columbia) (Verifier Painted Pony Petroleum)
Client: Devon Linear Gas Operations
Verifier for the BC Linear Gas Facility operations greenhouse gas emissions report submitted to the BCMOE for the 2014-2016 reporting year.

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Alliance Pipelines – Application for Climate Change and Emission Management (CCEM) Fund*
Provided senior direction and expertise on the development of the emission reduction quantification report for the Irma and Morinville Recovered Energy Projects in support of the application for funding through CCEM.

Greenhouse Gas Emission Report under O.Reg. 452/09 (Verifier)
Client: Cardinal Power
Lead verifier for a cogeneration facility reporting under Ontario's Greenhouse Gas Emission Reporting Regulation for 2011, 2012 and 2013 reporting years. Senior technical reviewer for 2014-2016 reporting year.

Verification of Compliance Report, Alberta
Auditor for verification of a mining facility emission report under Alberta's Specified Gas Emitters Regulation. Including desktop assessment, verification design and sampling plan. Reviewed records, re-aggregated and recalculated emissions.

Offsetting Greenhouse Gas Emissions from Federal Participation in International Events*
For the 2008 Francophonie (on behalf of the department of Defense) and the 2010 Vancouver Olympics designed the criteria for emission reductions and request for proposal documents , some quantification of emission, and review of all contracting documents and eligibility against the developed criteria.

Provincial Developments and Various Program*
Responsible for analysis of various provincial developments and various programs engaged by the provinces and states for emission reductions and offsetting (i.e. Western Climate Initiative, Regional Greenhouse Gas Initiative).

Contributor to Canada's Offset System: Guide for Verification Bodies*
Contributor to Canada's Offset System: Guide for Verification Bodies – a document detailing the requirements for Verification Bodies, the verification and the administrative processes for the verification of offset credits.

Co-Author of Canada's Offset System: Guide for Project Proponents* (Co-author)
Co-author of Canada's Offset System: Guide for Project Proponents – a document detailing the eligibility of offset credits and administrative process for the issuance of offset credits through greenhouse gas emission reductions.

Federal Greenhouse Gas Regulations*
Provided assistance and guidance for federal greenhouse gas regulations requiring verification.

Greenhouse Gas Verification of Baseline and Compliance Reports*, Alberta (Lead Auditor)
Lead auditor for third party reviews of greenhouse gas baseline and compliance reports for eight (8) energy-related facilities under Alberta's Specified Gas Emitters Regulation, including natural gas and coal-fired electricity generation as well as cogeneration.

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Air Emissions Estimation

Certificate of Approval Applications
Prepared over three dozens of Certificate of Approval Applications for air discharges including office buildings, lumber mills, chemical laboratories and process applications. As part of the Certificate of Approval for air, modeling and contaminant transport was performed.

Section 71 Reporting for Connacher Oil and Gas Limited
Compiled and reported substance use at oil sands facilities for compliance under the Section 71 Chemical Management Program.

Certificate of Approval Applications
Prepared dozens of Certificates of Approval (Air) for a variety of facilities from commercial to industrial facilities.

Emission Inventories for Ontario Regulation 127 and the National Pollutant Release Inventory
Prepared numerous emission inventories for Ontario Regulation 127 and the National Pollutant Release Inventory.

Quantification of Greenhouse Gas Emissions
Quantification of greenhouse gas emissions and reporting under the Green Municipal Fund and for a variety of oil and gas companies in Alberta and British Columbia.

Permitting and Regulatory Compliance

NPRI and O.Reg 127/01 Reporting in Various Sectors, Ottawa, Ontario (Project Manager)
Project manager and completed NPRI and O.Reg 127/01 reports for printing presses, a steel plant, a chemical manufacturing facility, office buildings, a foundry, vehicle/bus repair garages, and a local college.

NPRI and O. Reg 127/01 Reporting for Government Buildings, Ottawa, Ontario (Project Manager)
Project manager and reporter for the completion of NPRI and O.Reg 127/01 reporting for numerous governmental office buildings throughout the National Capital Region.

Pollution Prevention

Pollution Prevention Plan Working Document (Lead Project Manager and Risk Manager)
Lead Project Manager and Risk Manager responsible for the hydrazine team and the development of the Working Document for the Pollution Prevention Plan Working Document under the Chemical Management Plans.

Review and Development of Costing Algorithms for Air Pollution Control Technologies
Regulatory review and development of costing algorithms for air pollution control technologies for the base metal smelting industry.

Pollution Prevention Plans for Federal Facilities
Prepared over a dozen Pollution Prevention Plans for federal facilities encompassing issues such as energy and water efficiency, release of ozone depleting substances, greenhouse gas emissions and solid waste

Regulatory Permitting / Entitlements / Approvals

Hauled Liquid Waste
Prepared a Certificate of Approval Application for a private waste transfer site for hauled liquid waste.

** denotes projects completed with other firms*

Nicole Flanagan B.A., M.A.Sc., P.Eng

Senior Atmospheric Environments Engineer · 20 Years of Experience · Ottawa, Ontario

Industrial Sewage Works
Prepared Certificate of Approval Applications for Municipal Sewage Works and Industrial Sewage Works.

Prepared over Three Dozen Certificate of Approval Applications for Air Discharges
Prepared over three dozen Certificate of Approval Applications for air discharges including office buildings, lumber mills, chemical laboratories and process applications. As part of the Certificate of Approval for air, modeling and contaminant transport was performed.

Stormwater Sampling
Potable Water Sampling, Ottawa, Ontario (Project Manager)
Project coordinator and technical team member for sampling potable water in over 30 federal office buildings in the National Capital Region.

Wastewater
Wastewater Sampling, Ottawa, Ontario (Project Manager)
Oversaw monthly wastewater sewer sampling and reporting programs for various businesses in Ottawa.

Wastewater Reclamation and Reuse
Water Audit
Performed a water audit, reuse and recycling study for a high profile plating facility.

Building Energy Audit
Energy and Water Audits for over a Dozen Federal Facilities
Performed energy audits and water audits for over a dozen federal facilities in Ottawa and Hull.

Environmental Compliance Audits
Robert O'Pickard Environmental Centre, Biosolids Audit
Performed an environmental compliance audit against regulatory criteria, best management plans, and an environmental management system for the City of Ottawa's Biosolids Handling Program.

PUBLICATIONS

Driscoll, N.A., M.A. Warith, and K.J. Kennedy. The Potential of Soybean Peroxidase to Remediate Contaminated Soil Systems. Proceedings of the 53rd Canadian Geotechnical Conference, The Canadian Geotechnical Society, Montreal, Quebec, 2000.

Driscoll, N.A., M.A. Warith, and K.J. Kennedy. The Potential of Soybean Peroxidase for Remediation. Advances in Water Research, Vol. 1, p. 1-15, 2000.

** denotes projects completed with other firms*

Pierre-Luc Pigeon P.Eng.

Electrical Engineer · 13 Years of Experience

Stantec

Pierre-Luc Pigeon is an electrical engineer with experience in electrical engineering in the areas of power, control and protection. His first projects involved distribution work in the construction sector. He then became project engineer for a major manufacturer of electrical equipment where he specialized in designing MV/LV equipment.

Throughout the projects, he developed considerable expertise in protection & controls systems. Among other tasks, he supervised the design and construction of switchgears for large-size government and industrial projects.

Today, he works on energy transmission & distribution projects for various utilities companies for the replacement of substations equipment, upgrade of protection systems and the analysis of AC/DC station services. He is involved in the design, calculations and studies as well as coordination of the engineering team.

He also participates in factory acceptance testing for MV/HV equipment. M. Pigeon keeps an updated knowledge base of the latest industry standards, testing protocols and results interpretation of the equipment test reports. He has performed FAT around North America and Europe for substation equipment such as transformers & switchgears.

Mr. Pigeon's work has enabled him to develop excellent knowledge of different energy providers' processes and requirements. Mr. Pigeon is known for his analytical skills, initiative and energy.

EDUCATION

Bachelor of Electrical Engineering, Sherbrooke University, Sherbrooke, Quebec, 2004

CERTIFICATIONS & TRAINING

ETAP, Montreal, Quebec, 2016

Relays and Protection, CIPE, Montreal, Quebec, 2010

Ground Fault Protection, CIPE, Montreal, Quebec, 2008

SCADA, Réseau des ingénieurs du Québec, Montreal, Quebec, 2012

Hydro One Station Safety Awareness, IHSA, Ontario, Ontario, 2011

Coordination & Arc Flash Study, Schneider Electric, Montreal, Quebec, 2008

REGISTRATIONS

Engineer #169281, Engineers & Geoscientists British Columbia

Professional Engineer #100163955, Professional Engineers Ontario

Electrical Engineer #136911, Ordre des ingénieurs du Québec

** denotes projects completed with other firms*

Pierre-Luc Pigeon P.Eng.

Electrical Engineer · 13 Years of Experience

PROJECT EXPERIENCE

Transmission & Distribution, Substations

Transformer replacement - Transmission stations (5 projects), Ontario, Ontario (Electrical Engineer), 2012-present
Client: Hydro One
Performed site surveys and prepared the proposals.
Designed protection and control systems (EWDs, CWDs, E/A) for new power transformers and/or protection relays.
Design AC/DC station service systems.
Prepared deliverables including sketches/drawings, bills of materials, NMS lists, cable lists and protection descriptions.
Produced technical specifications and reviewed drawings.

Breaker replacement - Transmission station (10 - 15 projects), Ontario, Ontario (Electrical Engineer), 2012-present
Client: Hydro One
Performed site surveys and prepared the proposals.
Designed protection and control systems (EWDs, CWDs, E/A) for new MV/HV breakers and/or protection relays.
Prepared deliverables including sketches/drawings, bills of materials, NMS lists, cable lists and protection descriptions.
Produced technical specifications and reviewed drawings.
Ensured technical coordinatio

Major equipment and protection replacement for distribution substation (8 projects), Ontario, Ontario (Electrical Engineer), 2012-present
Client: Hydro Ottawa
Performed site surveys.
Prepared drawings, technical specifications and reports.
Design for upgrades to all protection, controls, SCADA and station service systems.
AC/DC load study.
Oversaw factory witness testing of power transformers.

Breaker replacement – Transmission stations (2 projects), Quebec, Quebec (Electrical Engineer), 2012-present
Client: Hydro-Quebec
Performed site surveys.
Designed protection and control systems (EWDs, CWDs, E/A) for new MV/HV breakers and/or protection relays.
Prepared deliverables including drawings, bills of materials and cable lists.
Produced technical specifications.

Factory acceptance tests for various projects (Transformers, Switchgears, P & C Buildings), Various cities, Quebec and Ontario (Electrical Engineer)
Client: Various clients
Review of specifications and drawings.
Review of the test plan and industry standards.
Inspection & witnessing of tests.
Production of reports with finding & recommendations.

Design of ground fault protection systems for multiple sources*, Montreal, Quebec (Electrical Engineer), 2005-2008
Client: Various clients
Assessed electrical installations.
Designed a protection system (MDGF) and produced schematic diagrams.
Tested and validated systems.
Designed a training session and gave a presentation.

** denotes projects completed with other firms*

William Woods MPM

Project Manager · 14 Years of Experience

Stantec

Mr. Woods has over 10 years' experience in the telecommunications field. A graduate from the Project Management Program at Carleton University, his career path has included multiple roles with increasing responsibility including key management positions at BayCADD, Dessau and Stantec. Mr. Woods has been heavily involved in fiber design, layout, management of applications, permits and permissions for placement and in delivery and support of the solutions. Mr. Woods is known for his excellent project managements skills, his leadership, creativity and is driven by success.

EDUCATION

Masters, Project Management, Carleton University, Ottawa, Ontario, 2010

PROJECT EXPERIENCE

Telecommunications

Multiple Projects, Ottawa, Ontario (Project Manager), 2012-present
Client: Multiple Clients
As project manager I am responsible for the overall coordination, direction, implementation and execution of several projects with Canada's major cable and communications companies. My responsibilities include facilitating the definition of project scope, establishing goals and deliverables, defining project tasks and resource requirements, developing project plans and managing million dollar project resources and budgets. I am responsible for planning and scheduling tracking deliverables, quality, risk and project communication. As project manager my role also involves progress reporting, problem resolution and overall relationship management.

Data Services Management* (Senior Project Manager / IT Manager), 2008-2012
Managing data services projects involving the design, development and implementation of the network infrastructure for Cogeco and Rogers contracts across Ontario. Responsibilities included acting as the single point of contact for operational, contract and for end to end project activities.
DESIGN DESIGN ENGINEER / IT MANAGER
- Using Osmose's O-Calc software to perform analysis of structural loads on utility poles. O-Calc analyzes attachments, wind speed, ice buildup, load angles, and all pertinent codes including CSA.
- Using CommScope's SpanMaster to perform analysis of cable spans and tensions between utility poles under various environmental conditions.
- Using Geographic Information Systems (GIS) in conjunction with Global Positioning Systems (GPS) to capture and create a database of utilities' positions and attributes.
- Provided underground utilities location and marking services for CATV, telephone, gas, hydro, sewer & water and other major utilities. Required interfacing with internal resources, external contractors and managing tight timelines.

Computer and Network Assistance* (Network and IT Support), 2007-2008
Providing Computer and Networking assistance at Algonquin College, in labs and lecture rooms for students and professors not familiar with the software and hardware.

Network Analysis* (Network Analyst), 2004-2007
- Providing Computer, Network and Communication Support Svces for an industry leading Contact Centre using Cisco based Voice over IP technology.
- Setup of IPCC software and Cisco phone registration on CCM.

** denotes projects completed with other firms*

William Woods MPM

Project Manager · 14 Years of Experience

- Setup and Troubleshooting of Genesys call management integration with Cisco platform.
- Setup and config. of Avaya to IP Phone solution via VPN tunnel.
- Setup and configuration of access and voice VLANs for Network.
- Configuration of 2800 series Routers for VoIP communication via point to point T1, creating and managing Group Policy for all accounts, creating new accounts/groups with memberships and rights in AD, managing OU's within Active Directory for users/computers.
- Setup and monitoring of servers, routers, and links utilization to maintain a strong core, and setup of all systems including software for call centre/data entry environment.
- Maintaining strong client relations for software support and updates.
- On call RSA/VPN support for systems and servers, and documenting server error logs and performed tape backups.
- Technical documentation and analysis for change request that may impact service.
- Training of new desktop admin on software setup for all 25 contracts, as required.
- Provide second and third level support for all software, systems and servers.
- Managing of PRI phones and admin IP phones.
- Network printing and email support.
- Beta testing of new Microsoft appl. and operating syst. for techn. research.
- Provided quotes of hardware/software for procurement purpose.
- SQL support for Captiva Scanning process and Peoplesoft Client Records.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

Stantec

Mr. Lafleur combines background experiences and knowledge in electrical engineering, infrastructure/facilities/systems design, electrical equipment specifications, cost estimating, technical documentation, and coordinating projects, of varying complexity, in the conceptual through commissioning phases for the building services, airports and aviation, the mining industry and other clients. Eric provides a diversity of services while participating on teams generating/implementing project–specific electrical designs for systems that effectively meet the requirements of project teams and the development objectives of clients for new and existing projects.

EDUCATION

Bachelor of Applied Science, Electrical Engineering, University of Ottawa, Ottawa, Ontario, 2007

REGISTRATIONS

Professional Engineer #100128231, Professional Engineers Ontario

Professional Engineer #28753, Association of Professional Engineers and Geoscientists of Saskatchewan

PROJECT EXPERIENCE

Airports & Aviation

Wabush Airport Apron Expansion and Parallel Taxiway, Wabush, Newfoundland and Labrador (Electrical Engineer)
Client: Transport Canada
Project Value: CAD 30,000,000
To minimize runway occupancy times and eliminate back tracking, a full Code D parallel taxiway, with associated LED lighting will be designed the length of Runway 18-36, approximately 40,000 sq. meters, connecting both thresholds. The main terminal apron is to be expanded 58,000 sq. meters to accommodate the forecast peak demand of scheduled and charter flights shown. Transport Canada is the owner and operator of Wabush Airport. The Project is managed by Public Works and Government Services Canada (PWGSC). Eric was responsible for construction administration support and review.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

Grantley Adams International Airport, Christ Church, Barbados (Electrical Engineer)
Currently ongoing, Eric is responsible for providing design support, peer review and construction administration services for the upgrade/replacement of existing airfield lighting fixtures and new apron floodlighting. This project addresses the Airport's need to resurface and extend airside asphalt surfaces, and includes the upgrades (from incandescent to LED fixtures) to the following lighting systems: Inset taxiway edge lights, inset runway centerline lights, inset touchdown zone lights, inset runway end and threshold lights, inset runway approach lights, and pole-mounted apron flood lights. Also, included in this project is the replacement and addition of underground conduit infrastructure where required for lifecycle renewal and maintenance.

Yellowknife Airport (YZF) Lighting Condition Assessment, Northwest Territories (Electrical Engineer)
Conduct an airfield lighting condition assessment at the Yellowknife (YZF) Airport. This report provides a detailed evaluation of the existing lighting systems and components and states deficiencies, potential system upgrades and recommendations. This included the review of maintenance staff concerns, megger test results, remaining service life of each component, compliance with the latest version of TP312 and setup a schedule for capital investments based on priorities.

Facilities Engineering

PSPC – CIBC Fire Alarm Report (Electrical Engineer)
Currently ongoing, responsibilities includes a detailed review of the existing fire alarm and detection system at the CIBC facility and write an assessment report detailing all findings as well as various options and budget costs for future upgrades.

PSPC – French Rover Arena AODA Upgrades (Ongoing) (Electrical Engineer)
Currently ongoing, the project scope if to facilitate the installation of a new vertical lift platform and a barrier-free washroom at the existing two-story area with the Accessibility for Ontarians with Disabilities Act (AODA). Responsibilities for the project is to oversee and provide senior peer review for the electrical drawing and specification package which include demolition plans as well as new power, lighting and fire alarm for the new lift.

Bayshore Fieldhouse Renovations (Electrical Engineer)
Provide electrical engineering from the concept through to the construction phase of this facility's refurbishment to suit the new building use. This included a total renovation of the electrical distribution services, lighting, power, emergency lighting and communications systems.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

Multiple Projects*, Various Locations, Ontario (Electrical Engineer), 2007-2012
Client: Piotrowski Consultants Ltd.
Designed electrical systems for commercial and industrial facilities which included electrical distribution (incoming services and riser diagrams), power and lighting systems, communications systems, and life safety systems. Responsible for contract administration on various projects which consisted of running design and construction meetings, reviewing construction progress, directing contractors, and evaluating various cost estimates. Collaborated with clients, architects, engineers, and various other personnel to successfully complete multiple projects which included new elementary schools and industrial building (manufacturing plants and welding shops) as well as a new hospital. Conducted technical reviews of existing building systems and provided a report of their condition and life expectancy. These reports summarized recommendations and budget pricing for future upgrades based on the level of importance.

NRC - U90/U91 Service Entrance and Generator Design (Project Manager / Lead Electrical Engineer)
Designed the new main electrical service, including entrance pole, power transformer and back-up generator power for both facilities to accommodate for existing and future loads. Construction administration for the project included kick-off meeting, constant site reviews and support for the project and contractor from the tender through to the close-out documents.

Hazardous Waste / Radioactive Waste Characterization Services Facility Project - B582A, Chalk River, Ontario, Chalk River, Ontario (Senior Electrical Engineer)
Client: Canadian Nuclear Laboratories Ltd.
Project Value: CAD 7,200,000
Designed the electrical (normal Class IV and emergency Class III power systems, fire alarm system, and telecom/data routing systems for the project. Of unique importance for this facility is the technical understating of the client's Hazardous/Radioactive waste processing to coordination the applicable design standards to integrate the requirements and safeguards into the facility design and operation.

Canadian Nuclear Laboratories, Tritium Facility Relocation Project Bldg 215, Ontario, Chalk River, Ontario (Construction Support for PM)
Client: Canadian Nuclear Laboratories
Responsibilities includes construction support and coordinating contractors on the CNL construction site. Duties included meetings, review and coordinate site instructions, change notices, shop drawings, review contractor estimates, and ensure construction matches engineered drawings.

Mining Engineering and Studies

Jansen Project, Saskatchewan (Electrical Supervisor)
Responsibilities included supervising and coordinating efforts with the Construction Management Group and electrical contractors on the Jansen surface site. Duties included daily meetings, review and coordinate electrical construction to match engineered drawings, ensure everyone is working safely and coordinate equipment delivery to site.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

Jansen Project, Saskatchewan (Engineer of Record)
Developed, designed and provided commissioning support of the fire detection and alarm system for the mining facilities which included detailed drawings to be incorporated into a vendor's proprietary system. The system design included tie-ins to all required mine interfaces (ventilation system shut-downs, suppression systems both stand-alone and dry-type sprinkler, processing plant tie-ins, magnetic door overrides, etc.) to ensure future mine wide communication. The system also included general detection and alarming devices that reported to local fire alarm control panels. Reviewed and approved detailed shop drawings as well as construction support during the implementation of the system on site. The system was designed to include for future expansion.

Copper Cliff South Mine Project, Ontario (Lead Electrical Engineer)
Coordinated and executed electrical design and engineering efforts and deliverables to setup contractors on site for future detailed engineering and construction. Conducted various site visits and completed asset integrity reports which determined the state of electrical equipment currently installed in the field.

Picadilly Potash Project, Potash Corporation, New Brunswick (Electrical Engineer)
Reviewed electrical drawings and schematics to bring detailed engineering design to completion. Provided engineering support to designers and drafters.

McArthur River, Saskatchewan
Completed the prefeasibility study for a ventilation upgrade including basic engineering drawings and estimates.

Vale Thompson, Footwall Deep Ventilation FEL2 Study, Manitoba (Engineering Manager / Lead Electrical Engineer)
Coordinated all engineering efforts for the ventilation feasibility study for the mine site and reported to the client on progress during weekly meetings. Provided engineering support to designers and drafters for all disciplines (structural, mechanical and electrical). Supported the estimating group with all material take-offs and costs.

Jansen Project, BHP Billiton Canada Inc., Saskatchewan (Electrical Engineer)
Responsibilities included developing drawings and details for the Service Shaft Headframe Complex and hoist houses while working with designers and drafters to produce a detailed engineering package for the mine site. Prepared design briefs which detailed design decisions and conclusions. Developed construction packages to define each task the contractors required to accomplish and coordinate with other disciplines. Prepared material estimates and construction/equipment specifications for the project.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

Engineering, Feasibility & Design

Vale Thompson, Footwall Deep Ventilation FEL2 Study, Manitoba (Engineering Manager, Lead Electrical Engineer)
Coordinated all engineering efforts for the ventilation feasibility study for the mine site and reported to the client on progress during weekly meetings. Provided engineering support to designers and drafters for all disciplines (structural, mechanical and electrical). Supported the estimating group with all material take-offs and costs.

Jansen Project, Saskatchewan (Engineer of Record)
Developed, designed and provided commissioning support of the fire detection and alarm system for the mining facilities which included detailed drawings to be incorporated into a vendor's proprietary system. The system design included tie-ins to all required mine interfaces (ventilation system shut-downs, suppression systems both stand-alone and dry-type sprinkler, processing plant tie-ins, magnetic door overrides, etc.) to ensure future mine wide communication. The system also included general detection and alarming devices that reported to local fire alarm control panels. Reviewed and approved detailed shop drawings as well as construction support during the implementation of the system on site. The system was designed to include for future expansion.

Jansen Project, Saskatchewan (Electrical Supervisor)
Responsibilities included supervising and coordinating efforts with the Construction Management Group and electrical contractors on the Jansen surface site. Duties included daily meetings, review and coordinate electrical construction to match engineered drawings, ensure everyone is working safely and coordinate equipment delivery to site.

Jansen Project, BHP Billiton Canada Inc., Saskatchewan (Electrical Engineer)
Client: BHP Billiton Canada Inc.
Responsibilities included developing drawings and details for the Service Shaft Headframe Complex and hoist houses while working with designers and drafters to produce a detailed engineering package for the mine site. Prepared design briefs which detailed design decisions and conclusions. Developed construction packages to define each task the contractors required to accomplish and coordinate with other disciplines. Prepared material estimates and construction/equipment specifications for the project.

Picadilly Potash Project, Potash Corporation, New Brunswick (Electrical Engineer), 2012
Client: Potash Corporation
Reviewed electrical drawings and schematics to bring detailed engineering design to completion. Provided engineering support to designers and drafters.

McArthur River, Saskatchewan (Electrical Engineer), 2012
Client: Cameco Corp.
Completed prefeasibility study for a ventilation upgrade including basic engineering drawings and estimates.

** denotes projects completed with other firms*

Eric Lafleur P. Eng.

Senior Electrical Engineer · 11 Years of Experience · Ottawa, Ontario

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Copper Cliff South Mine Project, Ontario (Lead Electrical Engineer)
Coordinated and executed electrical design and engineering efforts and deliverables to setup contractors on site for future detailed engineering and construction. Conducted various site visits and completed asset integrity reports which determined the state of electrical equipment currently installed in the field.

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CURRICULUM VITAE

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HEATHER AULD, M.Sc.

Location: Toronto, Canada
Year of Experience: 38

PROFESSIONAL BACKGROUND AND EXPERIENCE SUMMARY

Heather Auld is currently the Principal Climate Scientist at Risk Sciences International (RSI). She has over 38 years of experience in the fields of climate, meteorology and climate change adaptation. She spent over 32 of those years with Environment and Climate Change Canada in various regions across Canada (Edmonton, Vancouver, Toronto and Canadian Forces Trenton), where she has served as an engineering climatologist, climate change impacts and adaptation expert, weather forecaster, manager and operational meteorology instructor. Heather has provided climate and weather services and applied research for clients in Canada and internationally for engineering codes and standards and for transportation, water resources, environmental, air quality, energy, natural resource and other sectors/issues. She has served as an invited expert to many international delegations, including the Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization, UN Convention on Biological Diversity and UN Strategy for Disaster Risk Reduction.

VALUE ADDED

- ! Extensive research and development in climate change impact-driven updates to engineering codes and standards (over 25 years)
- ! Served as Climate Lead for several Engineers Canada PIEVC international and national projects, routinely provides climate change training to professional engineers, creating a highly effective climate science conduit between the application of climate science and engineering.

QUALIFICATIONS

- ! Professional Meteorologist: Professional Meteorologist Operational Training and Accreditation (Environment Canada, 1980);
- ! Master of Science (Meteorology) University of Alberta
- ! Bachelor of Science (Physics and Mathematics), University of Prince Edward Island

SELECT RELEVANT EXPERIENCE

Recognized **national expert** on climate change impacts and adaptation, engineering climatology, national codes and standards, energy-climate research, extreme event forensic analyses, disaster risk reduction planning and science-policy linkages;

Retired as Associate Director, Environment Canada's Adaptation and Impacts Research Division, managing multi-disciplinary staff in offices and universities across Canada;

Manager of Ontario Region atmospheric science programs focussing on science to policy issues and program support for environmental assessments, climate change adaptation, air quality, water resources, weather forecasting and climate services;

Invited member to National Building Code of Canada Climatic Loads Task Group responsible for climate adaptation issues and to CSA Expert Committees (27 years, ongoing);

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Developed scientific documentation with arguments supporting National Building Code Commission's decision to include climate adaptation in 2015 and subsequent National Building Codes;

National lead and Chair for Canadian Standards Association (CSA) Rainfall Intensity-Duration-Frequency Guide for Water Practitioners PLUS 4013 (V.1 & 2);

Lead for climate change chapter in CSA Permafrost PLUS 4011 and BNQ permafrost geotechnical standard for buildings;

Drafted and led development of a CSA standard (S502) on changing snow loads in Canada's North; member of National Technical Committee for development of 5 new standards for North;

Climate change lead for online Climate Resilient Systems Training in support of Engineers Canada PIEVC engineering vulnerability Protocol;

Lead for development of climate change guidance for Ontario Government updates to flood management Guide, for National Research Council on state of climatic design values and climate change;

Lead for development of climate change guidance for several **municipal adaptation planning processes** (e.g. Calgary, Peel Region, Kingston);

Lead of a Canada-U.S. Expert Panel on climate change best practices to deal with projection uncertainties and modelling;

Co-lead in development of climate and infrastructure forensic analyses system;

Climate change co-lead for several PIEVC assessments on:

- ! City of Mississauga PIEVC Parks Assessment
- ! Toronto Hydro electrical distribution system – Phases I and II; Ontario Hydro One electrical transmission system transformer and connecting node for eastern Greater Toronto Area
- ! MetroLinx rail and selected stations; Support to other major highway assessments in B.C.
- ! Toronto Public Housing complexes; Support to other PIEVC building assessments
- ! Durham wastewater treatment
- ! Ottawa stormwater systems
- ! Northwest Territories Highway 3 and Winter Ice Road network
- ! Southeastern Ontario First Nations wastewater, drinking water and stormwater systems
- ! Honduras assessment of four major bridges, etc.

Decades of research activities focussed on ice accretion issues for electrical distribution and transmission systems aviation, road transportation;

Management support for development of the former Canadian Climate Change Scenarios Network;

Initiator and co-lead for development of a national Atmospheric Hazards Program supporting provincial disaster management planning, environmental assessments, climate studies, etc; Invited to present Program to World Meteorological Organization and to other invited country presentations;

Provided analyses and testimony for several forensic analyses of high profile extreme weather events in Canada, including Walkerton waterborne disease outbreak, Royal Commission on Dryden air crash, Ice Storm '98, significant marine and highway accidents, etc;

Invited member to several National Committees, Royal Commissions, Round Tables, on public safety, infrastructure, standards and codes, transportation, climate adaptation, etc;

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Extensive weather forecasting and atmospheric science experience, including Alberta Weather Centre (Edmonton), Pacific and Yukon Region (Vancouver); Ontario Weather Centre (Toronto); and NORAD/Canadian Air Force(CFB Trenton);

Instructor for operational meteorology training of new university recruits and upgrading for professional weather forecasters;

Author of many peer-reviewed publications and international reports on climate and weather science and adaptation.

INTERNATIONAL

Canadian representative for several international Programs and UN Conventions dealing with climate change, biodiversity, energy, water resources, disaster management, capacity building;

Lead author for IPCC SREX Special Report (2012) on "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation" – National Chapter;

Invited participant to WMO Expert Team on Climate and Energy (2008 and 2012); and **WMO and UN Global Framework for Climate Services Working Group** on energy sector (2014);

Lead of World Meteorological Organization (WMO) Expert Team on Weather/Climate Hazards for disaster management;

Invited by **UN International Strategy for Disaster Reduction** and UN Development Program to provide climate adaptation and services training for infrastructure resilience;

Invited participant to ISO standard on data systems for Arctic and Antarctic oil and gas development (ongoing);

Member of several Canadian delegations to UN Convention on Biological Diversity - focus on climate, water and biodiversity synergies between the UN Sustainable Development Conventions;

Helped in leading delegation from World Federation of Engineering Organizations into agreements with World Meteorological Organization on climate services and disaster reduction;

Invited to participate on international adaptation projects in several countries (China, Honduras, Costa Rica, Malaysia);

Climate lead for PIEVC engineering vulnerability and capacity building projects in Costa Rica (water treatment), Honduras (bridges);

Invited part-time professor, North China Electric Power University, Beijing, China.

CURRICULUM VITAE

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NORMAN J. SHIPPEE, B.Sc., M.Sc., Ph.D

Location: Ottawa, Canada

PROFESSIONAL BACKGROUND AND EXPERIENCE SUMMARY

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QUALIFICATIONS

2016 Ph.D, University of Victoria, Department of Geography, Climate Lab
Dissertation: *Seasonal Storminess in the North Pacific, Bering Sea, and Alaskan Regions: Applied Storm Metrics and Methods for Seasonal Prediction*
Supervisor: Dr. David E. Atkinson

2010 M.Sc., Applied Meteorology, Plymouth State University.
Thesis: *Classification of Mesoscale Snow-Bands in the Northeast United States*
Advisor: Dr. Samuel T.K. Miller

2008 B.Sc., *summa cum laude;* Plymouth State University.
Major: Meteorology
Minor: Technical Mathematics

SELECT RELEVANT EXPERIENCE

2011- Present

- ! **Costa Rica Climate Vulnerability Assessment Projects**: Provided support of data gathering, quality control and validation for gridded datasets applicable to project asset sites in Costa Rica. Developed and coded programs to calculate drought indices for time scales ranging from 1 month to 48 months using the standardized precipitation index (SPI). !

N. SHIPPEE

- **Belize Climate Vulnerability Assessment Project:** Developed and provided support for development of project climate analytics for Belize climate vulnerability assessment project sites, similar to efforts conducted in Costa Rica, but included an additional effort for drought index calculations for observational datasets and future projection datasets, requiring additional QA/QC and new programs for the calculation with non-gridded datasets. Also, provided review and sections of final report documentation, including support for probability scoring of values for drought in the "PIEVC-light" framework from Engineers Canada.
- **Vietnam Climate Vulnerability Assessment Project**: Development of an extensive suite of climate data analytics products for application in the Vietnam water resources infrastructure climate vulnerability assessment with Engineers Canada and GIZ. Prior to RSI's first trip to Vietnam, Dr. Shippee evaluated global temperature and precipitation datasets for application in Vietnam and internationally, wrote scripts to gather initial temperature and precipitation data at specific grid boxes based on needed locations, and formatted in a manner that could easily be added to RSI's CCHIP Tool. After RSI received observational datasets from Vietnam, Dr. Shippee adapted the SPI calculation scripts to run for each of the 16 stations, and then applied monthly precipitation deltas to determine changes in drought patterns by adjusting the initial observation datasets.
- **Updates to consider climate change for Canadian Standards Association CSA Standards PLUS 4013-12 Technical Guide for Development, Interpretation and Use of Rainfall Intensity-Duration-Frequency (IDF) Information: Guideline for Canadian Water Resources Practitioners** – Development of updates to the CSA IDF Technical Guide in partnership with the CSA Standards Development Committee for IDF Guidance.
- **Updates to consider climate change for Canadian Standards Association CSA Standards PLUS 4013-12 Technical Guide for Development, Interpretation and Use of Rainfall Intensity-Duration-Frequency (IDF) Information: Guideline for Canadian Water Resources Practitioners** – Development of baseline climate and climate change values (deltas) that are representative of different temperature and climate zones in the Arctic for the 2050s and the 2080s, along with documentation of approaches to incorporate climate change. The material is intended for application in a new edition of CSA Group's CSA PLUS 4011 guideline currently under development for permafrost in Canada.
- **Ontario Centre for Climate Impacts and Adaptation Resources First Nations Community Climate Profiles** – Generated profiles, including graphics and analytics, for many Ontario First Nations communities that included basic and complex climate information.
- **Ontario Ministry of Natural Resources and Forests Climate Change and Future Flood Flows** – Generated projected changes to future design storms in Ontario using the Clausius-Clapeyron relation, investigated trends in extreme rainfall events for Ontario, and investigated the emergence of new extreme storm types in the province.
- **City of Mississauga Parks PIEVC** – Provided climate analytics, threshold analysis, PIEVC support, workshop facilitation, and reporting for the PIEVC analysis of three Mississauga parks within the overall Climate Change Project for the City.
- **Meteorological Services of Canada Future Projections of Heat Warning Events** – Provided analysis of historical and future occurrences of heat warning events using maximum and minimum temperature thresholds used to define multi-day heat events across Canada.
- **Credit Valley Conservation Authority Risk and Return on Investment Tool** – Provided analysis of future design storms under climate change and estimates of change in return period of flooding events across Canada using IDF stations.
- **INAC Climate Index Tool Phase** II – Provided support in documentation of the INAC Climate Index Tool, along with the expansion of the original Climate Index under phase II of the INAC project.
- **Public Services and Procurement Canada Climate Change Adaptation Risk Assessment** – Presented climate background and facilitated workshops for the PSPC Climate Change Adaptation workshops held in Ottawa.
- **Engineers Canada PIEVC IRP Training -** Training content developer and instructor tasked with developing knowledge transfer products consisting of multiple training modules for Engineers Canada's pending professional development and IRP Certification online training series, launching in 2018.
- **RSI CCHIP -** Teaching multiple impact assessment practitioners aspects of RSI's Climate Change Hazards Information Portal (CCHIP) in webinar and in-person sessions.
- **National Research Council** – Co-authored report for the *Knowledge Gaps in Existing Climatic Data and Climate Change Models Used of Design and Rehabilitation of Canada's Core Public Infrastructure (CPI)*
- **Ontario Ministry of Natural Resources and Forests** – Provided background and options for inclusion of climate and climate change into the current riverine flood guide.

- **ECCC Networks of Networks (NoN) Project** - Conducted interviews for RSI to collect metadata for provincially owned meteorological and hydrometric data networks throughout Canada in the first phase of the NoN project for Environment and Climate Change Canada
- **Durham PIEVC** - Contributed to PIEVC assessments for Durham PIEVC assessment, analyzing Lake Ontario seiche occurrence, lake and riverine water levels and in Ontario, and providing historical literature search for Lake Ontario water levels
- **General** – Analysis of observational, reanalysis, and climate model data from multiple sources (ECMWF, NOAA, Environment Canada)
- **PhD Work (NOAA/MEOPAR)** - Performed an inter-comparison of objective storm tracking methods using both Lagrangian and Eulerian methodologies, explicitly examining the impact of different core definitions of a "storm"
- **PhD Work (NOAA/MEOPAR)** - Investigated the ability to create skillful assessments of storm activity in the study region from a monthly to seasonal standpoint, with a goal of generating seasonal storm activity outlooks for the North Pacific, Bering Sea, and Alaskan regions
- **PhD Work (NOAA/MEOPAR)** - Created a climatology and trend analysis of wind lull periods for the circumpolar region, targeted at using non-stormy periods as a proxy for safe operations in the North.
- **PhD Work (NOAA/MEOPAR)** - Investigated the relationship of lull periods to known Northern Hemispheric teleconnections
- **PhD Work (NOAA/MEOPAR)** - Worked directly with industry and community partners to generate useful analyses from the operational and "on-the-ground" perspective
- **PhD Work (NOAA/MEOPAR)** - Designed and conducted survey work through questionnaires and in-person interviews with multiple user groups, including professional scientists, ship captains, and community members
- **PhD Work (NOAA/CIFAR/ACCAP)** - Implemented extratropical cyclone tracking methods at the Alaska Region Supercomputing Center (ARSC) and University of Victoria
- **PhD Work (NOAA/CIFAR/ACCAP)** Created a storm surge grid using ADCIRC for a theoretical coastline of Nome, AK to investigate the needed fetch to generate a damaging surge

2008 – 2011

- Classified types of mesoscale snow banding events in wintertime storms in the northeast United States
- Determined a set of independent predictors outside of conventional forecast methods to predict the type and location of banding events before they occur
- Created synoptic composites to determine physical differences between banding event types
- Performed regression analysis to determine best predictors of banding events and tested on independent dataset to "forecast" snow banding event location and type.

2004 – 2008

- Analyzed 1-minute resolution dataset from 22 radiation and wind monitoring stations within a 10 mile radius of the Seabrook nuclear power plant in Seabrook, NH
- Performed QC and usability checks on data before refining to hourly data using a floating triangular filter
- Analyzed correlation between radiation values and wind direction for evidence of radiation plume dispersion from power plant
- Gain familiarity with NOAA meteorological and hydrological datasets at NCDC and NDBC
- Analyzed tidal prediction error at gauges in the Gulf of Maine as a result of Ekman transport toward the shoreline
- Correlated wind direction with a tidal difference function (observed - predicted) to determine the amount of error explained by Ekman transport

PUBLICATIONS

Shippee, N; 2017 : Seasonal Climatology and Trends of Strong Wind and Lull Events in the Circum-Arctic During the 1980 - 2010 Period Using a Novel Lull/Storm Wind Indicator. 29th Conference on Climate Variability and Change, 97th AMS Annual Meeting, Seattle, WA.

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Shippee, N; 2017 : Seasonal Predictability of Extratropical Cyclone Statistics in the Canadian Seasonal to Interannual Prediction System (CanSIPS). 29th Conference on Climate Variability and Change, 97th AMS Annual Meeting, Seattle, WA.

Shippee,N, D. E. Atkinson, K. Hodges, 2016 : Climatological Patterns of Cyclone Activity in the North Pacific and Alaskan Regions using the Twentieth Century Reanalysis. *J. of Climate.* Submitted.

Shippee,N, D. E. Atkinson, J. Partain 2016 : Seasonal Climatology and Trends of Strong Wind and Lull Events in the Circum-Arctic During the 1979-2010 Period Using a Novel Lull/Storm Wind Indicator. J. of Applied Meteorology and Climatology. Accepted with revisions.

Shippee,N, D. E. Atkinson, 2016 : The Potential for Seasonal Forecasting of Winter Storminess Indicators in the North Pacific and Alaskan Regions. In Preparation.

Pingree-Shippee, K, N. J. Shippee, D. E. Atkinson, 2016: Overview of Bering/Chukchi Sea Wave States for Selected Severe Storms. Journal of Atmospheric and Oceanic Technology.

Shippee, N; 2014: An Intercomparison of Semi-Eulerian and Lagrangian Based Cyclone Tracking Methods for the North Pacific and Alaskan Regions. 47th AGU Fall Meeting, San Francisco, CA, Amer. Geophys. Union, A33D-3216.

Shippee, N; 2014: Developing weather indicators for Arctic Shipping seasonal outlooks. Arctic Change Conference, Ottawa, Canada.

Shippee, N; 2014: The Development of a Seasonal Extratropical Cyclone Activity Outlook for the North Pacific, Bering Sea, and Alaskan Region. Statistics and Climate Workshop, Oslo, Norway.

Shippee, N; 2013: Seasonal Storminess in the North Pacific, Bering Sea, and Alaskan Regions. 12th Conference on Polar Meteorology and Oceanography, Seattle, WA, Amer. Meteoro. Soc., P10.4.

Shippee, N; 2012: Probabilistic Forecasting of Storm Activity at the Monthly to Seasonal Scale, with an Arctic Regional Focus. Network of Expertise on Transportation in Arctic Waters (NEXTAW) Workshop, Churchill, MB.

Shippee, N; 2010: Analysis and prediction of heavy banded snow events in the Northeastern United States using independent variables. 9th Student Conference, Atlanta, Ga, Amer. Meteoro. Soc., P1.69.

Shippee, N; 2010: Analysis and prediction of heavy banded snow events in the Northeastern United States using independent variables. 35th Northeastern Storm Conference, Saratoga Springs, NY, Amer. Meteoro. Soc., WN2.3

Shippee, N; 2008: Analysis of the C-10/REF Dataset. 33rd Northeastern Storm Conference, Springfield, MA, Amer. Meteoro. Soc.

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CURRICULUM VITAE

SIMON L. ENG, B.Eng

Location: Toronto, Canada

PROFESSIONAL BACKGROUND AND EXPERIENCE SUMMARY

Simon Eng has combined degrees in civil engineering and meteorology, studying the impacts of climate and weather on the built environment. Since 2007, Simon's work has focused primarily in the field of climate change impacts and adaptation, both in government and private industry capacities. Throughout his career, Simon has assisted in conducting detailed climate and severe weather risk assessments for critical infrastructure, as well as comprehensive reviews of existing codes, standards and other guidance as they relate to the interaction of climate and weather with buildings and infrastructure, addressing climatic design loads and climate change adaptation measures. Through his roles as a forecast assistant and researcher of historically significant weather events, Simon also has experience with public outreach and other stakeholder engagement, including on-site forensic damage investigations immediately following severe weather events.

VALUE ADDED

- Climate and climate change analyses for assessment of future risks for numerous climate vulnerability assessments involving municipal infrastructure
- Strong background in climate impact thresholds for engineered systems, including climate impacts forensics

QUALIFICATIONS

2009-2012 Certificate in Meteorology (Graduate Level), York University, Toronto, Ontario
2003-2008 Bachelor's in Civil Engineering, Ryerson University, Toronto, Ontario

SELECT RELEVANT EXPERIENCE

Climate and Climate Change

- Experienced in use of climate change model projections and literature for development of tailored future climate risk assessments and scenarios
- Climate and change adaptation main field of research, full and part-time positions, since 2007.

Meteorology of High Impact Weather

- Operational and research experience as well as formal learning in meteorology

Civil Engineering

- Bachelor's degree in Civil Engineering with focus on structural design, including reinforced concrete, fiber reinforced polymer (FRP) and steel structures
- Thesis work consisted of assessment of electrical distribution system design for high winds, impacts of weathering on utility pole integrity and potential effects of climate change

Research skills

- Enjoy research process, "detective work" aspect of data gathering and assessment from multiple sources (e.g. media, personal eyewitness accounts, raw meteorological data, literature reviews)

People Skills

- Facilitation of workshopping activities
- Conducting interviews for post-storm damage surveys and severe weather research
- Team work and co-ordination, including administrative and project management experience
- Volunteer experience with hospitality services and public school outreach

Communication Skills

- Oral communication: numerous workshop and conference presentations and associated contributions, instructor for training of professional engineers, government staff and summer students
- Written communication: report writing, contributions to conference papers

Consultant – July 2011 – Present (March 2017)

- Risk Sciences International; Analyst:
    - Identification of important climate change risks through community, practitioner & other stakeholder engagement; analysis of results for engineering and community risk assessments & other applications
    - Analyses of climate change projection data and literature to assess future risks for public and private infrastructure, prioritization of key vulnerabilities, development of adaptation options and other response measures
    - Forensic assessments of a variety of high impact atmospheric events in numerous climatic regions, focusing on climatological extremes
    - Validation of climate change projections through comparison to observed historical data and trends, climate analogues
- Ministry of Natural Resources: Climate Change Impacts Risk Assessment for Forest Blowdown
    - Conducted risk assessment for forest blowdown potential in Clay Belt Region of Northeastern Ontario under changing climate

Researcher – Adaptation and Impacts Research Section, Climate Research Division, Environment Canada, Toronto, Ontario – **July – August 2007**; **June 2008 – October 2011.**
Multiple interdisciplinary projects involving infrastructure and building codes and standards, links to high impact severe weather events for use in climatic hazards and climate change adaptation:

- Conducted forensic analyses of past weather events and generated impacts database
    - Collection and compilation of impacts reports from newspaper archives, eye-witness accounts, official surveys, etc.; documentation used on Hazards.ca website to provide climate hazards information for stakeholders and municipalities in Ontario
    - Provided interdepartmental training for impacts data collection
- Wrote several internal documents detailing research projects and initiatives
    - Engaged engineering practitioners to determine climate and weather needs, determine interdisciplinary gaps in knowledge
    - Preliminary reports combining specific infrastructure, building and vegetation damage/failure thresholds with wind gust velocity

Forecast Assistant – Ontario Storm Prediction Center, Environment Canada, Toronto, Ontario – **May-August 2006; September 2006-March 2007 (Part-time).**
Position usually held by meteorology student; however, own personally acquired knowledge and skill sufficient to be effective in position:

- Post-storm damage assessments for wind storm classification, outreach for those affected
    - Video/photo documentation of damage; located and interviewed eyewitnesses; additional sources of damage information (e.g. cold-calling areas targeted using meteorological remote sensing data)
    - Compilation of internal reports survey results, meteorological data relating to event
- Operational forecasting support during severe weather events
    - Facilitated communication between public, trained storm spotters and operational forecasters during events, documented reports
    - Aided in associating spotter reports with real-time remote sensing data for warning and tracking of storms

SELECT RELEVANT EXPERIENCE

City of Mississauga Climate Change Plan – Parks Infrastructure PIEVC assessment and Community CC Impacts Risk Assessment. (2017, 2018)

As a component of the City of Mississauga's climate change plan, a PIEVC climate change risk assessment was conducted for three city parks, ranging from a small park located along the Lake Ontario shoreline, through to much larger parks which occasionally host events with attendance numbering in the thousands to tens of thousands of visitors. The application of the PIEVC Protocol to natural and green infrastructure represents a novel application of the tool, which produced unique results. In addition to this, the assessment included not only a review of city owned and operated assets, but also an assessment of risks to city and regional staff as well as different park user groups, which again represented a novel application of the protocol.

INAC – Climate Index Tool Development Phases 1 and 2 (2017, 2018)

The Climate Index Tool is an MS Excel based tool which incorporates information on First Nations Community (FNC) characteristics, combined with records of historical climate impacts and instrumented observations, as well as climate change projection information to understand the relative risk posed by climate and climate change hazards to FNCs across Canada. Prior to this, INAC had developed a list of priority climate change related impacts and hazards for first FNCs, which acted as a focus for the Climate Index Tool design. The current beta version of the tool addressed the top four hazards identified by INAC; i.e., inland flooding, wildfire, sea-level rise, and winter road degradation. The Tool remains under development and is intended as a high-level decision making tool for policy and financial decisions, and will shortly enter a third phase to operationalise the Tool.

City of Calgary Climate Change Adaptation Planning Advisory Services. (2017-18)

RSI, in partnership with Alberta Watersmart, Nodelcorp Consulting and WSP were retained to provide follow-up advisory services to the City of Calgary after our team completed the City of Calgary Climate Vulnerability Assessment Project. The Advisory Team was tasked with providing Calgary with ongoing support and review of Adaptation Plans and implementation scheduling for risk reduction measures intended for the City.

Engineers Canada Course Module Development for Infrastructure Resilience Professional (IRP) webinar instruction series offered by Engineers Canada for IRP certification students. (2017)

Engineers Canada retained RSI to develop new course modules and online training products to offer the Professional Engineering and Asset Management Sectors training in climate data analytics acquisition and application, climate vulnerability risk assessment, the PIEVC framework, and building multidisciplinary teams for climate risk assessment.

Engineers Canada Course Module Delivery (lectures and workshopping) for IRP certification candidates from professional engineering sector. (2018)

Engineers Canada retained 5 RSI professional staff to lecture and deliver the online lectures and workshops for Infrastructure Resilience Professional (IRP) candidates in 2017/2018. RSI delivered this online training, and developed and administered assignments and examinations through the delivery of this professional development training.

Credit Valley Conservation (CVC) Risk and Return on Investment Tool (RROIT) Development Project. (2017, 2018)

RSI was retained to develop a new tool to estimate Risk and Return on Investment (RROIT) specific to flooding impacts in Ontario municipalities. The tool under development for CVC is intended to be a tool for eventual application across Canada for assessment of RROIT for flood impacts/damages for Canadian municipalities.

City of Calgary, Climate Change Vulnerability and Risk Assessments, with associated adaptive actions and indicators across 15 City of Calgary Business Units. (2015, 2016)

These business units include: CEMA, Calgary Fire Department, Calgary Neighbourhoods, Calgary Parks, Calgary Recreation, Facility Management, Planning & Development, Calgary Transit, Roads, Transportation Infrastructure, Waste & Recycling and Water Resources & Water Services. Project involves application of the ICLEI BARC (Building Adaptive and Resilient Communities) Framework, as initiated by the City of Calgary, in order to complete the required Vulnerability and Risk Reporting in alignment with the BARC Milestone 2. The results of Milestone 2 will feed into the development of a report that addresses goals, objectives, targets, adaptive actions, indicators and implementation tools for completion of BARC Milestone 3, completion of a Climate Action Plan for the City. MMM is engaged on this project as part of a team that includes Alberta Watersmart, Risk Sciences International and Nodelcorp. (Initiated June 2016)

City of Toronto: Metro Hall Building Condition Assessments with PEIVC Climate Vulnerability Assessment. (2016-17)

A PIEVC climate vulnerability assessment integrated with building condition assessments (BCAs) for Metro Hall Tower in the City of Toronto. Metro Hall is a 28-storey office tower that hosts several critical City of Toronto services, including Toronto's 311 Service and Toronto Water. The PIEVC assessment further informed the BCA by considering the risks posed by rare but extreme climate and weather events, as well as helping to better characterise the effects that climate change may have on the structure.

PIEVC Assessment of Six Representative Metrolinx Assets. (2015-16)

Metrolinx is a provincial Crown corporation which is responsible for managing an integrating public transportation across southern Ontario's Greater Toronto and Hamilton Area (GTHA) and surrounding population centers. As part of its Corporate Climate Adaptation Plan, itself a component of the Metrolinx

Fiver Year Plan, a PIEVC risk assessment was conducted looking at six representative assets within the Metrolinx system, with RSI and the Toronto Region Conservation Authority providing expertise and analyses of climate and severe weather-related hazards for the assessment.

Toronto Hydro Electrical Distribution System PIEVC Climate Vulnerability Assessment. (2012; 2014,2015)

A two-part PIEVC assessment was conducted for the Toronto Hydro-Electric Systems Limited, with RSI acting as the lead climate change expertise. Part 1 was relatively brief and only considered historical climate, while Part 2 was a system-wide assessment considering both historical and future projected climate information. Part 2 was further informed by significant, high impact severe weather events which generated widespread power outages in the city, particularly events in July and December of 2013. This PIEVC assessment was particularly successful, in that many of the resulting recommendations have since been implemented by the utility.

INTERROGATORY RESPONSE - EPRF-86

2-EP-57-i

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, pages 280-281 and Attachments H and I

SUBJECT AREA: Distribution System Plan

Preamble:

"*Renewal of aged, and decayed overhead infrastructure to withstand climatic forces from storm events is key to resilience over the long term for the system. Most notably, Pole Renewal programs support the development of this resilience".*

"Increased operational capability: Hydro Ottawa will continue to invest in appropriate technologies to augment its response to outages when weather events do cause interruption. These include system capacity investments to maintain sufficient operational capacity and redundancy, as well as, automation investments, to enable remote and automatic isolation and restoration of faulted system components."

a) Please provide a list of 2021-2025 capital expenditures with dollar amounts, for each expenditure, each year that Hydro Ottawa is proposing to deal with the risks identified in the reports filed as Exhibit 2, Tab 3, Sch. 4, Attachments H and I. For each capital expenditure explain how it mitigates the specific risk that it is addresses and identify any that are required to maintain redundancy.

b) Please provide a list all 2021-2025 OM&A expenditures with dollar amounts for each expenditure for each year that Hydro Ottawa is proposing to deal with the risks identified in the reports filed as Exhibit 2, Tab 3, Sch. 4, Attachments H and I. For each OM&A expenditure explain how it mitigates the specific risk that it is addresses.

RESPONSE:

a) Please see the response to interrogatory OEB-111.

b) Please see the response to part (a) above.

INTERROGATORY RESPONSE - EPRF-87

2-EP-57-ii

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. J, page 32

SUBJECT AREA: Distribution System Plan

Please file a table that describes the actions that Hydro Ottawa is taking in response to the recommendations resulting from the ISO55000 Gap Analysis listed on page 32.

RESPONSE:

A table of Hydro Ottawa's response to the recommendations resulting from the ISO 55000 Gap Analysis can be found in the response to interrogatory OEB-58 part (g).

INTERROGATORY RESPONSE - EPRF-88

2-EP-58

EXHIBIT REFERENCE:

Exhibit 2, Tab 3, Sch. 4, Att. K, pages 15, 18, and 51

SUBJECT AREA: Distribution System Plan

a) Were Hydro Ottawa ratepayers in Kanata-Marchwood surveyed as part of the Market Analysis? If the answer is no, please explain why not.

b) Please confirm that avoided transmission costs may not result in a saving for Hydro Ottawa ratepayers since Hydro Ottawa is not an electricity transmitter.

c) According to Figure 5-1 approximately 5% of Eligible Customers in the Kanata-Marchwood are participating in CDM and that percentage is expected to increase to 15% by 2025. Please confirm that the expectation is based on mathematical model projections and not a survey of Kanata-Marchwood customers.

RESPONSE:

a) No, Hydro Ottawa ratepayers in Kanata-Marchwood were not surveyed as part of the Market Analysis. In order to calculate the end-use profiles for residential and commercial sectors, the consultant who wrote the report used “end-use profiles from the IESO’s recent achievable potential studies, as well as [Natural Resources Canada] residential and commercial end-use surveys,” as noted on page 18 of Attachment 2-4-3(K): Local Achievable Potential Study.

b) In the Local Achievable Potential Study, avoided costs are the “anticipated marginal cost” of energy, capacity, or both that the utility would have had to pay if it built a plant to generate that much power. Avoided transmission costs may result in savings for Hydro

Ottawa ratepayers if a transmission upgrade that required capital contribution from Hydro Ottawa was avoided.

c) According to the consultant who authored the report, the adoption curve in this figure was developed based on "the historical participation in CDM programs and the values of the bass diffusion equation." This reference can be found on page 51 of Attachment 2-4-3(K): Local Achievable Potential Study. It is based on a mathematical model and not a survey of Kanata-Marchwood customers.

INTERROGATORY RESPONSE - EPRF-89

2-EP-59

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Schedule 6, Table 5

SUBJECT AREA: Reliability

a) Please provide a graphical representation of Hydro Ottawa System Reliability 2014-2019 (SAIFI and SAIDI and OEB standard).

b) Please determine relative Hydro Ottawa historic reliability among its Ontario Peer group and provide a chart showing where Hydro Ottawa is relative to the Ontario peer group (SAIDI and SAIFI) (https://www.oeb.ca/oeb/_Documents/RRR/2018_Yearbook_of_Electricity_Distributors.pdf)

c) Why is Hydro Ottawa SAIFI worse than the Clearspring EA benchmark group, given the increase in Capex over the past 5 years? Please discuss.

d) Is Hydro Ottawa targeting its System Renewal Capital towards improving Reliability? Discuss and provide examples.

RESPONSE:

a) Please see the graphical representation below in Tables A and B. The Excel version is appended as Attachment EPRF-89(A): 2014-2019 SAIFI & SAIDI. The OEB standard is represented as the five-year average.

Table A – 2014-2019 SAIFI

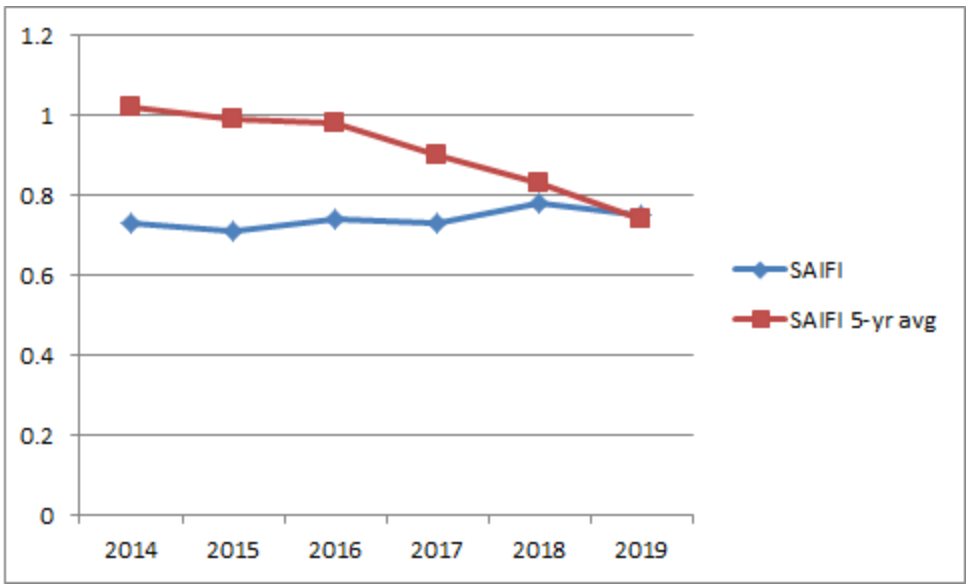
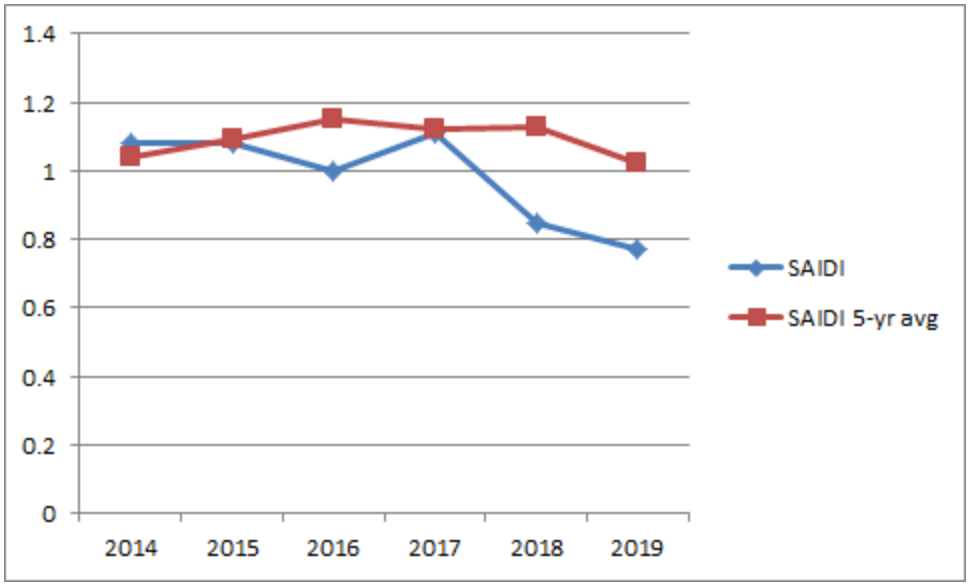


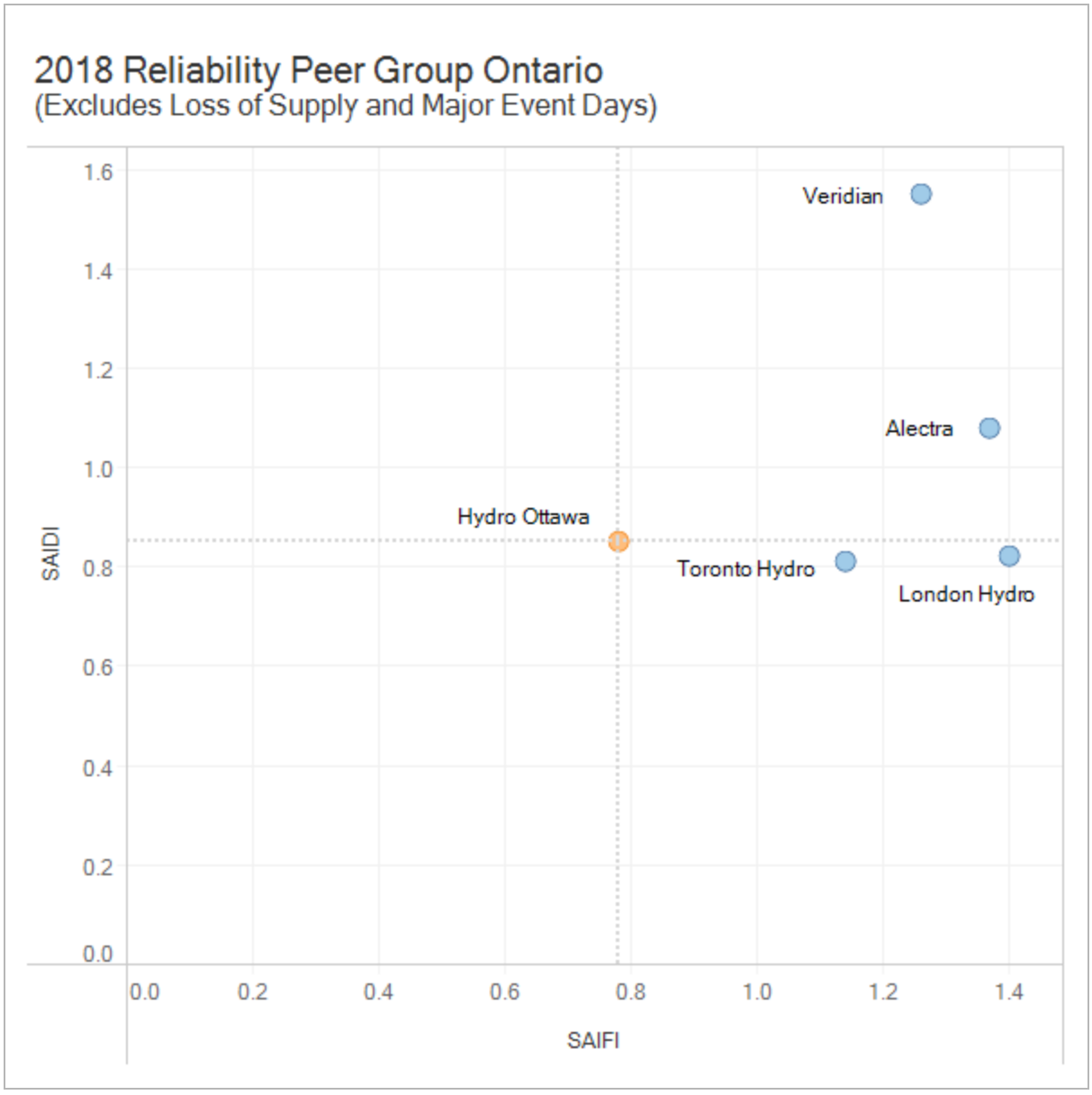
Table B - 2014-2019 SAIDI



b) Hydro Ottawa's reliability among its peer group in Ontario from the OEB's 2018 Yearbook of Electrical Distributors is shown below in Table C. Hydro Ottawa's SAIDI performance is slightly higher than that of Toronto Hydro and London Hydro for 2018.

Hydro Ottawa's SAIFI performance significantly outperformed all other peer group utilities for 2018.

Table C – 2018 Reliability Performance - Ontario Distributor Peer Group



c) Clearspring Energy Advisors ("Clearspring") included Loss of Supply outages in the benchmarking metric of SAIFI to align with the reporting of many U.S. utilities included in

the peer group. Many U.S. utilities are vertically-integrated and have direct control over the reliability of their transmission supply. Hydro Ottawa is not vertically-integrated and relies on Hydro One Networks Inc. to provide a reliable transmission supply. Reliability performance of the transmission supply to Hydro Ottawa in 2018 was particularly poor, which affected the three-year average used by Clearspring in its benchmarking study.

d) Hydro Ottawa is balancing cost versus performance by setting an appropriate pace for proactively renewing infrastructure to prevent future negative impacts to safety, reliability, and financial performance. Please refer to Attachment 2-4-3(E): Material Investments for specific System Renewal spending rationale by program/project.

INTERROGATORY RESPONSE - EPRF-90

2-EP-60

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Schedule 6, pages 9 and 10, Table 8, Figure 1, Table 9 and Figure 2

SUBJECT AREA: Reliability

a) Please confirm that LOS is a major contribution to outages.

b) Please provide the historic and 2019 year data for LOS (% of outages) with MEDs excluded. Discuss the significance of the result and compare to defective equipment (% of outages.)

c) What is Hydro Ottawa doing to reduce LOS interruptions?

d) Why are tree contacts not reducing, given the increase in VM in recent years? Please discuss and indicate if the current VM cycles are/are not appropriate.

e) Please provide the SAIFI and SAIDI targets for the 2020-2025 CIRP period.

RESPONSE:

a) Yes, Loss of Supply (“LoS”) is a major contributor to outages.

b) The OEB began reporting Major Event Days (“MED”) in 2016. Data from 2016-2019 is provided below in Tables A and Table B.

Table A – Annual Contribution to SAIFI without MED

	2016	2017	2018	2019
LoS	19.57%	21.35%	23.59%	14.86%
Defective Equipment	19.66%	19.71%	25.40%	21.82%

Table B – Annual Contribution to SAIDI without MED

	2016	2017	2018	2019
LoS	7.38%	5.61%	6.93%	14.12%
Defective Equipment	26.91%	26.62%	32.50%	26.48%

The data illustrated above indicates that LoS is a significant contributor towards customer outage frequency (SAIFI) and less of a contributor towards outage duration (SAIDI). Comparing LoS versus defective equipment, they both contribute on average equally to SAIFI. Defective equipment-related outages have a more significant impact towards SAIDI.

c) Hydro Ottawa collaborates with Hydro One Networks Inc. through the regional planning process to find cost-effective solutions to mitigating outages. Hydro Ottawa also builds redundancy into its distribution system, such as having station transformers supplied from seperate transmission supplies and distribution feeder connections between stations.

d) Please see the response to interrogatory OEB-112.

e) Please see the response to interrogatory EPRF-16.

INTERROGATORY RESPONSE - EPRF-91

2-EP-61

EXHIBIT REFERENCE:

Exhibit 2, Tab 4, Schedule 6

SUBJECT AREA: Reliability

a) Does Hydro Ottawa record Momentary Interruption data?

b) If so please, provide the 2015-2019 MAIFI data and discuss trends

---

RESPONSE:

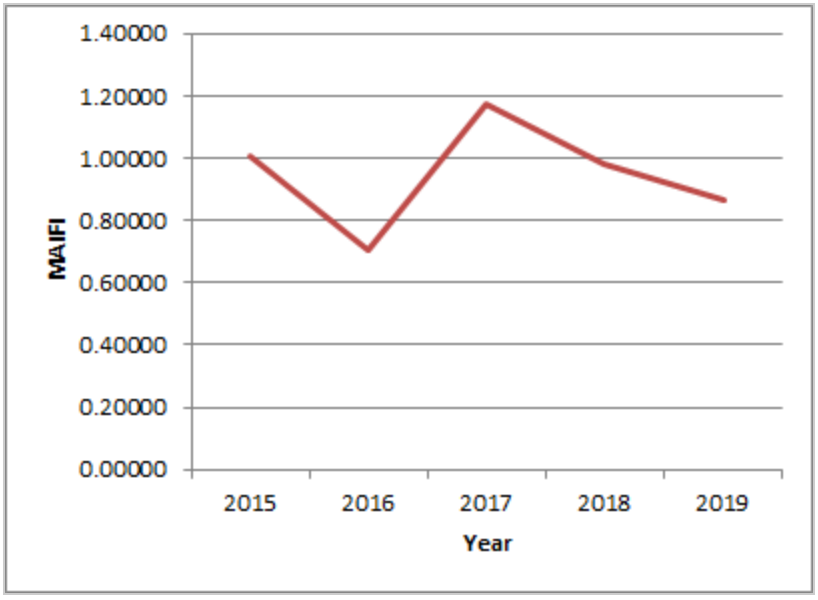
a) Yes, Hydro Ottawa records Momentary Interruption Data.

b) Please see the MAIFI data shown in Table A and Figure A below. Hydro Ottawa's MAIFI trend over the period of 2015-2019 has been flat, although improving, over the last two years.

Table A – 2015-2019 MAIFI

Year	MAIFI
2015	1.01126
2016	0.70371
2017	1.17562
2018	0.98313
2019	0.86739

Figure A – 2015-2019 MAIFI



INTERROGATORY RESPONSE - EPRF-92

3-EP-1

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 1, Tables 1, 2, and 3 pages 2 and 3

SUBJECT AREA: Load Forecast

a) For the Residential customer class please reconcile the increase in the 2021-2025 energy sales shown in Table 1 with the decline in the 2021-2025 demand sales forecast shown in Table 2.

b) For the Residential customer class please reconcile the decline in the 2021-2025 demand sales forecast shown in Table 2 with the increase in the number of Residential customers shown in Table 3.

RESPONSE:

a) Table 1 in UPDATED Exhibit 3-1-1: Load Forecast provides customer class sales forecast at the MWh level. Residential sales are increasing, as customer growth is stronger than decline in average use. Table 2 shows the billing demand forecast. The billing demand is only for customer classes that include a billing demand component in the tariff. Billing demands are declining as commercial and industrial rate class sales are declining.

b) There is no residential billing demand forecast in Table 2. The residential customer class does not have a billing demand charge.

INTERROGATORY RESPONSE - EPRF-93

3-EP-2

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 1, Table 2; Exhibit 2, Tab 4, Sch 3, page 280; Exhibit 2, Tab 4, Sch.3, Att. H, RSI report, Table 5, page 95

SUBJECT AREA: Load Forecast

Please reconcile the decline in the 2021-2025 demand sales forecast shown in Exhibit 3, Tab 1, Sch. 1, Table 2 with the increased probability of Extreme Heat in the Ottawa area by the 2050s. shown in the RSI report, Exhibit 2, Tab 4, Sch.3, RSI Report, Att. H, Table 5, page 95 and discussed at Exhibit 2, Tab 4, Sch 3, page 280.

RESPONSE:

Total class billing demand is essentially flat from 2021-2025, increasing from 9,456,512 in 2021 to 9,457,798 in 2025. While the General Service 50 to 1,000 kW Non Interval class billing demand is declining, other classes see increasing billing demand (General Service 50 to 1,000 kW Interval) over the period, as billing demand is driven by the corresponding class sales forecasts. Billing demand represents the cumulative monthly demand units used for calculating billing demand revenues; it is the sum of each customer's monthly billing demand. It is not a system peak demand estimate and is not necessarily tied to peak-producing weather conditions, as a customer's individual billing demand can happen at any hour across the billing period.

INTERROGATORY RESPONSE - EPRF-94

3-EP-3

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 1, Att. C, Table 5, page 17

SUBJECT AREA: Load Forecast

a) Are the Average Use and Sales numbers shown in the table weather normalized? If the answer is yes, please discuss the reasons for the decline in residential average use and sales in 2017 followed by the large increase in 2018. If the answer is no, please explain the weather conditions that caused the changes in those two years.

b) Please explain the reasons for the increase in residential average use and sales in 2024.

RESPONSE:

a) The average use and sales numbers are not weather-normalized. The annual heating and cooling degree days in 2017 were both below the 20-year normal levels. The opposite was experienced in 2018 – annual heating and cooling degree days were significantly higher than the 20-year normal levels.

b) Average use begins to increase in 2022 as the decline in end-use intensities softens and CDM saving projections flatten. The larger increase in 2024 over 2023 is partially a function of the leap year, which adds 1 additional day of usage.

INTERROGATORY RESPONSE - EPRF-95

3-EP-4

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 1, Att. C, Table 6, page 22

SUBJECT AREA: Load Forecast

a) Please explain the reasons for the decline in sales in 2017 for the GS 50, GS 1000 and GS 5000 classes but an increase in sales for the GS 1500 class.

b) Please explain the reasons for the larger increase in sales in 2024 for the GS 1500 class than for other classes.

RESPONSE:

a) The annual heating and cooling degree days in 2017 were both below the 20-year normal levels. The opposite was experienced in 2018, where annual heating and cooling degree days were significantly higher than the 20-year normal levels. The growth in the GS 1500 class is driven by customer growth. Customer growth outpaces any impact of weather.

b) The larger increase in 2024 over 2023 is partially a function of the leap year, which adds one additional day of usage.

INTERROGATORY RESPONSE - EPRF-96

3-EP-5

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 1, Att. C, Table 6, page 22

SUBJECT AREA: Load Forecast

Please explain the reasons for the decline in peak demand of 8.7% in 2014 and the increase in peak demand of 4.3% in 2020.

RESPONSE:

The peak demand, shown in Table 9 of UPDATED Exhibit 3-1-1: Load Forecast, is not weather-normalized. Fluctuations in historical year-over-year demands are driven by the peak-day weather conditions. The peak in 2014 occurred in June and the weather conditions were mild in comparison to 2013, which peaked in July. The 2020 peak is based on normal peak-producing weather, which is higher than the 2019 peak-day weather.

INTERROGATORY RESPONSE - EPRF-97

3-EP-6

EXHIBIT REFERENCE:

Exhibit 3, Tab 1, Sch. 2, Att. A, Tables 1 and 2, page 1

SUBJECT AREA: Load Forecast

In Table 2, there is a column showing Actual Sales for 2020 which are compared to Forecast Sales for 2020 shown in Table 1. Please explain how Hydro Ottawa can show actual sales for 2020 in an exhibit filed May 5, 2020.

RESPONSE:

The 2020 number for the Actual Sales in Table 2 in both the original and UPDATED Attachment 3-1-2(A): Summary and Variance of Actual and Forecast Data is the forecasted number from the 2021-2025 load forecast.

INTERROGATORY RESPONSE - EPRF-98

3-EP-7

EXHIBIT REFERENCE:

Exhibit 3, Tab 2, Sch. 1, Table 1, page 3

SUBJECT AREA: Other Revenue

a) Please explain why the Late Payment Penalty revenues is not expected to increase despite the increase in the number of customers from 2021 to 2025.

b) Please explain the reasons for the large decrease in Other Income & Deductions from $5.168 million in 2018 to $1.828 million in 2019.

RESPONSE:

a) Late payment revenue in 2018 decreased from 2017 by 3%, while the number of customers increased by 2%. For details, please see UPDATED Attachment 4-1-3(C): OEB Appendix 2-L - Recoverable OM&A Cost per Customer and per Full Time Equivalent. In 2019, late payment revenue further declined by 5%, despite the number of customers increasing by almost 1%. This reduction is largely explained by continued efforts to promote automated payment withdrawal services and the effective use of the Auto Dialer tool to issue automated customer reminders by phone. Despite an increase in customers, these efficiency improvements have supported more timely payments by customers, thereby mitigating the risk of late payments.

b) The large decrease in Other Income & Deductions from 2018 to 2019 is explained in UPDATED Exhibit 3-2-1: Other Revenue Summary, sections 5.4 (Services to Hydro Ottawa Affiliates) and 5.6 (Variance Analysis). The large increase is due to a $3.2M Service Level Agreement cost allocation to USoA 4330 Costs from Merchandising and Jobbing.

INTERROGATORY RESPONSE - EPRF-99

4-EP-1

EXHIBIT REFERENCE:

Exhibit 3, Tab 2, Schedule 1, Attachment B, Appendix 2-N, Shared Services and Corporate Cost Allocation

SUBJECT AREA: Shared Services and Corporate Cost Allocation

a) Please clarify Intercorporate transactions related to Facilities:
   - Confirm HOHI is a service receiving entity and HOL a service providing entity.
   - Why are Market costs listed? Is HOL charging HOHI Market Cost or HOL fully allocated cost for these two services?

b) Please provide a table that shows the Corporate Cost allocations and Allocation Factors to all affiliates including HOL.

c) Please list the details of allocations that are not direct

---

RESPONSE:

a) Hydro Ottawa provides facilities services to Hydro Ottawa Holding Inc. ("Holding Company"). Hydro Ottawa charges the Holding Company rent at market price and facilities operations and maintenance services at fully allocated cost, as shown in Table A.

Table A – Hydro Ottawa Facilities Service to Holding Company - Pricing Methodology

Facilities Service	Pricing Methodology
Base rent	Market
Building operations, maintenance, insurance, property taxes, utilities, furniture	Cost

b) Please refer to the lower table entitled “Corporate Cost Allocation” for each year in UPDATED Attachment 3-2-1(B): Appendix 2-N - Shared Services and Corporate Cost Allocation for the Corporate Cost Allocations and the allocation factors. The percentage allocated to affiliates, including the percentage retained in the Holding Company, represents the difference between 100% and the percentage allocation to Hydro Ottawa.

c) None of the allocations are direct charge. For further details, please refer to Table 2 - Pricing Methodology for Services Received from the Holding Company in Exhibit 4-2-1: Shared Services and Corporate Cost Allocation.

INTERROGATORY RESPONSE - EPRF-100

4-EP-2

EXHIBIT REFERENCE:

Exhibit 4, Tab 1, Schedule 4, Updated, Table 10

SUBJECT AREA: OM&A

a) Please confirm the 2019-2020 OM&A Expense increases by 10.07%

b) Please provide drivers/explanations for the 2019-20 for the increases in the following Back Office costs

- Collections, Accounts & Activities
- Corporate costs
- Customer and community relations
- Information Management and Technology

RESPONSE:

a) The OM&A Expense increase from 2019 to 2020 was 10.7%, and not 10.07% as stated in the question.

b) The drivers/explanations for the increases requested were as follows:

i) Collections, Accounts & Activities - please see the response to interrogatory OEB-143.

ii) Corporate Costs - the increase between 2019 and 2020 is largely due to the following two items:

1) In 2019, Hydro Ottawa received a Workplace Safety & Insurance Board ("WSIB") rebate of $0.8M due to an improvement in its year-over-year claim status.

2) In 2019, the Hydro Ottawa Holding Inc. spending was lower than estimated resulting in a reduction in the management services charged of $0.8M. The management services costs are allocated to the utility's affiliates based on its budgeted costs and time spent supporting each affiliate for the fiscal year. However, at year-end the allocations are reviewed, and any significant differences between actuals and budget are adjusted through a true-up process to ensure costs are properly allocated to each affiliate.

iii) Customer and community relations - please see the response to interrogatory OEB-144.

iv) Information Management and Technology - the increase between 2019 and 2020 is largely due to the following two items:

1) A one-time dark fiber termination fee of $1.5M is budgeted in 2020. The termination of the dark fiber service arrangements will yield annual operating cost savings of $1.1M per year. Please refer to Table 8 in UPDATED Exhibit 4-1-4: Operations, Maintenance and Administration Cost Drivers and Program Variance Analysis for details.

2) The remaining is largely explained by an increase in technology and automation, as outlined in Attachment 1-1-13(B): Digital Strategy and explained in section 2.7 of UPDATED Exhibit 4-1-4: Operations, Maintenance and Administration Cost Drivers and Program Variance Analysis.

INTERROGATORY RESPONSE - EPRF-101

4-EP-3

EXHIBIT REFERENCE:

Updated Exhibit 4, Tab 1, Schedule 5, Attachment A, and

Attachment C, Appendix 2-K Employee Costs

SUBJECT AREA: Compensation

a) Please confirm whether the annual Total compensation includes overtime.

b) Please provide a revised version of Appendix 2-K, Employee Costs **in Excel format**, to reflect:

- Positions (FTE)
- Management positions Executives and non-executive positions.
- Non-management employees by union and non-union.
- Overtime pay for each group
- Totals by Group and Overall
- The year over year % Total compensation increases for each group of employees
- The total 2016-2021 average TC increase % for each group.

c) Provide the amounts of expensed and capitalized total compensation costs for historical (2016-2019), bridge (2020), and projected test year (2021).

RESPONSE:

a) Hydro Ottawa confirms that annual total compensation includes overtime.

b) Please see excel Attachment EPRF-101(A): Appendix 2-K - Employee Costs - Overtime for a revised version of Appendix 2-K - Employee Costs, as requested. A separate tab in this attachment provides details of overtime by group.

c) Please see Attachment EPRF-101(A): Appendix 2-K - Employee Costs - Overtime.

INTERROGATORY RESPONSE - EPRF-102

5-EP-1

EXHIBIT REFERENCE:

Exhibit 5, Tab 1, Schedule 1, Attachment B; Exhibit 5, Tab 1, Schedule 1, Attachment L

SUBJECT AREA: Cost of Capital

a) Please provide the basis of the interest rates shown, relative to OEB requirements for Affiliated Debt and Market Rates at time of issuance for the following 2019 Affiliate Debt issues, and please reconcile the cost to the Long Term Debt Cost in Exhibit 5, Tab 1, Schedule 1, Attachment A.

7. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 16-Oct-19 10 years ($ 87,500,000) 2.66% -$ 2,327,500.00

8. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 16-Oct-19 30 years ($ 162,500,000) 3.21% -$ 5,216,250.00

b) Please provide the basis of the interest rates shown, relative to OEB requirements for Affiliated Debt and forecast Market Rates at time of issuance of the following issues. If the basis is the Indicative Pricing (Exhibit 5 Tab 1Schedule 1 Attachment L) as of October 2019; Confirm this will be updated as required prior to issuance for the following proposed 2020-25 Debt instruments and reconcile the cost to the Long Term Debt Cost in Exhibit 5, Tab 1, Schedule 1, Attachment A.

9. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 1-Jul-21 10 years $ 28,000,000- 3.07% -$ 859,600.00

10. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 1-Jul-21 30 years $ 52,000,000- 3.87% -$ 2,012,400.00

11. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 1-Jul-23 10 years $ 21,000,000- 3.92% -$ 823,200.00

12. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 1-Jul-23 30 years $ 39,000,000- 4.72% -$ 1,840,800.00

13. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 9-Feb-25 10 years ($ 123,850,526) 4.22% -$ 5,226,492.20

15. Promissory Note Hydro Ottawa Holding Inc. Affiliated Fixed Rate 25-Jun-25 10 years ($ 8,328,247) 4.22% -$ 351,452.01

RESPONSE:

a) On October 16, 2019, Hydro Ottawa issued two new promissory notes to Hydro Ottawa Holding Inc. ("Holding Company") with tenures of 10 years and 30 years, for a combined aggregate principal of $250M. The 10-year and 30-year promissory notes bear interest at a fixed rate of 2.66% and 3.21%, respectively. The rates for the promissory notes were based on the prevailing BMO Capital Markets ("BMO") weekly indicative rates for the Holding Company, with no allowance for issuance costs.

Hydro Ottawa issues debt through the Holding Company on a "pass through" basis for third party embedded/actual debt with fixed rates, terms, and maturity achieved by the Holding Company in the capital markets as per the OEB guidelines in the *Report of the Board on the Cost of Capital for Ontario's Regulated Utilities* issued in 2009 (the "OEB Cost of Capital Report"). These are the rates Hydro Ottawa has used since its first issuance in 2005. In each rate the utility has been at, or lower than, the deemed rate established by the OEB at the time of the debt issuance.

The OEB guidelines also state "[a]ffiliate embedded/actual debt with fixed rates, terms and maturity will get the lower of actual and deemed debt rate at time of issuance." In

keeping with the OEB's directives, the rate on the 30-year note utilized the October 16, 2019 indicative pricing report for the Holding Company issued by BMO which is indicative of third-party actual pricing at the time of issuance. This report is shown in Attachment EPRF-102(A): Hydro Ottawa C$ Pricing Update. For this particular issuance, the rate also matched the OEB's deemed long-term debt rate as calculated for September 2019, as shown in Attachment EPRF-102(B): September 2019 Cost of Capital Parameter Calculations.

The rate of 2.66% on the $87.5M 10-year note is drawn from the same BMO report that was used to determine the rate for the 30-year note, as described above.

The cost of the long-term debt cost shown in UPDATED Attachment 5-1-1(A): OEB Appendix 2-OA - Capital Structure and Cost of Capital for the last OEB-approved years (i.e. 2019 and 2020) reflects the approved rates and is drawn from the Appendix 2-OA Capital Structure and Cost of Capital which was submitted as part of the utility's 2019 rate adjustment application.[1] The long-term debt cost shown in UPDATED Attachment 5-1-1(A) for the Test Years 2021-2025 is drawn from Attachment 5-1-1(B): OEB Appendix 2-OB - Debt Instruments.

b) The rates for the long-term debt issuances in 2021, 2023, and 2025 are determined using the methodology described in section 3.5 of UPDATED Exhibit 5-1-1: Cost of Capital and Capital Structure. This approach utilizes the long-term Consensus forecast information to calculate a deemed rate at the time of issuance. This methodology is consistent with Hydro Ottawa's 2016 rate application[2] and, using the utility's historical spreads, emulates the deemed OEB's long-term debt rate calculation. This is updated at the time of issuance to reflect the actuals at that time using the OEB's deemed long-term debt calculation.

[1] Hydro Ottawa Limited, *2019 Electricity Distribution Rate Application*, EB-2018-0044 (August 13, 2018).
[2] Hydro Ottawa Limited, *2016-2020 Custom Incentive Rate-Setting Distribution Rate Application*, EB-2015-0004 (April 29, 2015).

The cost of the long-term debt cost shown in UPDATED Attachment 5-1-1(A): OEB Appendix 2-OA - Capital Structure and Cost of Capital for the Test Years 2021-2025 is drawn from Attachment 5-1-1(B): OEB Appendix 2-OB - Debt Instruments, where the long-term debt rate is calculated as the weighted average rate of existing embedded debt and forecast debt planned to be issued from 2021-2025.

Indicative Pricing as at October 11, 2019

HYDRO OTTAWA C$ INDICATIVE PRICING TERMS

	Fixed Rate				
Term	**2 year**	**3 year**	**5 year**	**10 year**	**30 year**
New Issue Spread	**59 bps**	**68 bps**	**82 bps**	**118 bps**	**160 bps**
CAD Benchmark Bond	Can 1.50% 08/21	Can 1.00% 09/22	Can 1.50% 09/24	Can 2.25% 06/29	Can 2.75% 12/48
CAD Benchmark Yield	1.64%	1.58%	1.50%	1.48%	1.61%
Curve Adjustment	-0.01%	0.00%	0.00%	0.01%	0.00%
CAD Coupon	**2.22%**	**2.26%**	**2.32%**	**2.66%**	**3.21%**
Spread to 3m BA	**33 bps**	**41 bps**	**51 bps**	**82 bps**	**127 bps**
Spread to 3m LIBOR	**51 bps**	**56 bps**	**61 bps**	**87 bps**	**138 bps**

Spread Changes	**2 year**	**3 year**	**5 year**	**10 year**	**30 year**
Week-over-Week	0 bps	0 bps	0 bps	0 bps	-3 bps

Comparable Issuers	**2 year**	**3 year**	**5 year**	**10 year**	**30 year**
Ontario	-	29 bps	45 bps	71 bps	82 bps
Hydro One	56 bps	66 bps	80 bps	116 bps	158 bps
Toronto Hydro	-	57 bps	68 bps	99 bps	139 bps

Note: Indicative credit spreads represent the bid-side of the secondary market by BMO CM's trading desk. New issue credit spreads are determined by a variety of factors. This can result in an issuance spread that may incorporate a new issue premium. Indicative swapped-equivalent levels do not include credit charge, if applicable.

Ontario Energy Board
Commission de l'Énergie de l'Ontario

Attachment: Cost of Capital Parameter Calculations

(For rate changes effective in 2020)

Return on Equity and Deemed Long-term Debt Rate

Step 1: Analysis of Business Day Information in the Month

Month: September 2019

Day		Bond Yields (%) Government of Canada 10-yr	Government of Canada 30-yr	A-rated Utility 30-yr	Bond Yield Spreads (%) 30-yr Govt over 10-yr Govt	30-yr Util over 30-yr Govt
1	1-Sep-19					
2	2-Sep-19					
3	3-Sep-19	1.13	1.40	2.94	0.27	1.54
4	4-Sep-19	1.13	1.40	2.96	0.27	1.56
5	5-Sep-19	1.26	1.53	3.06	0.27	1.53
6	6-Sep-19	1.28	1.50	3.04	0.22	1.54
7	7-Sep-19					
8	8-Sep-19					
9	9-Sep-19	1.34	1.55	3.09	0.21	1.54
10	10-Sep-19	1.43	1.62	3.15	0.19	1.53
11	11-Sep-19	1.42	1.63	3.17	0.21	1.54
12	12-Sep-19	1.45	1.67	3.20	0.22	1.53
13	13-Sep-19	1.51	1.71	3.24	0.20	1.53
14	14-Sep-19					
15	15-Sep-19					
16	16-Sep-19	1.48	1.67	3.20	0.19	1.53
17	17-Sep-19	1.45	1.63	3.15	0.18	1.52
18	18-Sep-19	1.43	1.59	3.12	0.16	1.53
19	19-Sep-19	1.43	1.58	3.09	0.15	1.51
20	20-Sep-19	1.39	1.54	3.04	0.15	1.50
21	21-Sep-19					
22	22-Sep-19					
23	23-Sep-19	1.37	1.52	3.01	0.15	1.49
24	24-Sep-19	1.30	1.48	2.96	0.18	1.48
25	25-Sep-19	1.39	1.57	3.05	0.18	1.48
26	26-Sep-19	1.36	1.54	3.02	0.18	1.48
27	27-Sep-19	1.36	1.54	3.02	0.18	1.48
28	28-Sep-19					
29	29-Sep-19					
30	30-Sep-19	1.37	1.53	3.01	0.16	1.48
31						
		1.36	1.56	3.08	**0.196**	**1.516**
	Sources:	*Bank of Canada*		*Bloomberg L.P.*	❶	❷

Step 2: 10-Year Government of Canada Bond Yield Forecast

Source: *Consensus Forecasts* Survey Date: September 9, 2019

	3-month	12-month		Average
September 2019	1.400	1.600	❸	**1.500** %

Step 3: Long Canada Bond Forecast

10 Year Government of Canada Concensus Forecast (from Step 2)	❸	1.500 %
Actual Spread of 30-year over 10-year Government of Canada Bond Yield (from Step 1)	❶	0.196 %
Long Canada Bond Forecast (LCBF)	❹	**1.696** %

Step 4: Return on Equity (ROE) forecast

Initial ROE			9.75 %
Change in Long Canada Bond Yield Forecast from September 2009			
LCBF (September 2019) (from Step 3)	❹	1.696 %	
Base LCBF		4.250 %	
Difference		-2.554 %	
0.5 X Difference			-1.277 %
Change in A-rated Utility Bond Yield Spread from September 2009			
A-rated Utility Bond Yield Spread (September 2015) (from Step 1)	❷	1.516 %	
Base A-rated Utility Bond Yield Spread		1.415 %	
Difference		0.101 %	
0.5 X Difference			0.050 %
Return on Equity based on September 2019 data			**8.52** %

Step 5: Deemed Long-term Debt Rate Forecast

Long Canada Bond Forecast for September 2019 (from Step 3)	❹	1.696 %
A-rated Utility Bond Yield Spread September 2019 (from Step 1)	❷	1.516 %
Deemed Long-term Debt Rate based on September 2019 data		**3.21** %

INTERROGATORY RESPONSE - EPRF-103

5-EP-2

EXHIBIT REFERENCE:

Exhibit 5, Tab 1, Schedule 1, Attachment C

SUBJECT AREA: Cost of Capital

Provide details on the amount(s) and cost of the Bank of Nova Scotia Line of credit.

RESPONSE:

The Bank of Nova Scotia credit facility is subject to a $5,000 annual renewal fee and is comprised of the following tranches:

Credit Number: 01 **Authorized Amount: $CAD 190,000,000**

The credit may be availed by way of:

- direct advances bearing interest at a rate of The Bank of Nova Scotia's Prime Lending Rate minus 0.50% from time to time, with interest payable monthly;
- banker's acceptances in multiples of $500,000 and having terms of maturity of 7 to 180 days, bearing interest at the applicable banker's acceptance rate plus a banker's acceptance fee of 0.80% per annum; and/or
- standby letters of credit and/or letters of guarantee bearing interest at a rate of 0.50% per annum.

A standby fee of 0.17% per annum on the daily unused portion of the credit is payable monthly. Advances are to be made in minimum amounts of $500,000.

Credit Number: 02 **Authorized Amount: $CAD 150,000,000**

The credit may be availed by way of:

- direct advances bearing interest at a rate of The Bank of Nova Scotia's Prime Lending Rate minus 0.50% from time to time, with interest payable monthly; and/or
- banker's acceptances in multiples of $500,000 and having terms of maturity of 7 to 180 days, bearing interest at the applicable banker's acceptance rate plus a banker's acceptance fee of 0.70% per annum.

A standby fee of 0.15% per annum on the daily unused portion of the credit is payable monthly. Advances are to be made in minimum amounts of $500,000.

Credit Number: 03 **Authorized Amount: $CAD 200,000,000**

Note: This credit was secured to assist with potential cash flow needs arising from business disruptions as a result of the COVID-19 pandemic. It expires on December 31, 2020.

The credit may be availed by way of:

- banker's acceptances in multiples of $500,000 and having terms of maturity of 7 to 180 days, bearing interest at the applicable banker's acceptance rate plus a banker's acceptance fee of 1.20% per annum.

A standby fee of 0.375% per annum on the daily unused portion of the credit is payable monthly. Advances are to be made in minimum amounts of $500,000.

Credit Number: 04 **Authorized Amount: $CAD 750,000**

Commercial procurement card availment; interest rate and repayment as per Cardholder Agreement.

Credit Number: 05 **Authorized Amount: $USD 200,000**

Commercial procurement card availment; interest rate and repayment as per Cardholder Agreement.

INTERROGATORY RESPONSE - EPRF-104

6-EP-1

EXHIBIT REFERENCE:

Updated, Exhibit 6, Tab 1, Schedule 1, Table 2

SUBJECT AREA: Revenue Deficiency Amounts & Cost Drivers

Please discuss and explain why Hydro Ottawa is proposing 2021-2025 rates that produce a cumulative Deficiency of $57 million dollars.

RESPONSE:

The cumulative revenue deficiency of $57 million dollars calculated in Table 2, as originally submitted, was determined by calculating what the revenue would have been with 2020 rates and the forecasted 2021-2025 load and customer numbers. Hydro Ottawa's proposed 2021-2025 rates have been designed to collect the requested annual revenue requirement.

Tables 4 and 5 in UPDATED Exhibit 6-1-1: Calculation of Revenue Deficiency or Sufficiency provide a high-level analysis of the revenue deficiency amounts and cost drivers for 2021-2025 period. Exhibit refencences have also been provided in these tables for further details on the annual cost drivers. What's more, summaries of the proposed revenue requirements and cost drivers can be found in UPDATED Exhibit 1-1-8: Executive Summary and UPDATED Exhibit: 1-1-9: Business Plan.

INTERROGATORY RESPONSE - EPRF-105

7-EP-1

EXHIBIT REFERENCE:

Updated Exhibit 7, Tab 1, Schedule 1, Table 1, Exhibit 7, Tab 1, Schedule 1, Attachment B, Elenchus Study

SUBJECT AREA: Cost Allocation

Preamble:

Hydro Ottawa was unable to obtain the hourly load profile data required to derive updated load profiles for this Application. As a result, demand data figures for the 2021 Cost Allocation Model have been calculated based on hourly demand figures used in previous rate applications, adjusted to the 2021 monthly load profile and customer count forecast.

a) Please indicate which years hourly load data were used for the Residential, GS< 50kw and GS> 50 kw.

b) Please confirm these are based on Hourly load profiles prepared by Hydro One for the 2006 Cost Allocation Information Filing (CAIF) are used for all classes except the Large Use class.

c) Please provide the annual scaling factors and resulting adjustments generated by Elenchus

---

RESPONSE:

a) Residential, GS<50 kW and GS>50 kW demand data is based on 2004 hourly data from the 2006 Cost Allocation Information Filing ("CAIF"), scaled to the 2021 weather-normalized load forecast.

b) Hydro Ottawa confirms the Hourly load profiles prepared by Hydro One Networks for the 2006 CAIF are used for all classes except the Large Use class.

c) Elenchus applied monthly scaling factors to reflect seasonal consumption trends in the demand data. Attachment OEB-156(A): 2021 Demand Factor Calculations illustrates the process used to calculate demand factors, including scaling factors and adjustments. The monthly scaling factors are provided in the 'Hourly load shapes by class' tab (see cells AR36:BA47). Annual scaling factors are also calculated (cells AR6:BA6) but not used in the derivation. Please see the response to interrogatory OEB-156 for additional detail.

INTERROGATORY RESPONSE - EPRF-106

7-EP-2

EXHIBIT REFERENCE:

Updated Exhibit 7, Tab 1, Schedule 1, Attachment B, Table 3

SUBJECT AREA: Cost Allocation

Preamble: The Elenchus study indicates that the current Residential fixed charge should be $16.61/mo maximum (Minimum System with PLCC**).** The current fixed rate is $27.79/mo.

a) Please provide an extract of the OEB Cost Allocation Report pages 13-14 that Elenchus references (footnote 7).

b) Please provide the progression of the Hydro Ottawa Residential fixed charge over the period 2015-2020.

c) Please compare the Hydro Ottawa 2020 Residential fixed charge to a sample of other Ontario utilities.

RESPONSE:

a) Please note that the footnote in the Elenchus report refers to pages 12-13 of the OEB Cost Allocation Report.[1] The title page, as well as pages 12-14, have been appended as Attachment EPRF-106(A): OEB Report - Application of Cost Allocation for Electricity Distributors (Excerpt).

b) Table A below outlines the progression of Hydro Ottawa's Residential fixed charge over the 2015-2020 period.

[1] Ontario Energy Board, *Application of Cost Allocation for Electricity Distributors*, EB-2007-0667 (November 28, 2007).

Table A – 2015-2020 Residential Rate Orders

Year	Fixed Service Charge	Volumetric Rate
2015	$9.67	$0.0234
2016	$12.96	$0.0193
2017	$16.60	$0.0151
2018	$20.51	$0.0105
2019	$24.29	$0.0054
2020	$27.79	-

c) Table B below provides a comparison of Hydro Ottawa's 2020 Residential fixed charge against a sample of other Ontario distributors.

Table B – Comparison of Ontario Distributors' 2020 Residential Fixed Service Charge[2]

Distributor	Fixed Service Charge
Toronto Hydro	$38.98[3]
Hydro One Acquired LDCs[4]	$35.66
Hydro One Networks	$33.52
Elexicon Whitby Zone	$32.02
Oakville Hydro	$29.89
Alectra Guelph Zone	$29.72
Greater Sudbury Utilities	$29.31[5]
Alectra Powerstream Zone	$28.43
Hydro Ottawa	**$27.79**
Alectra Horizon Zone	$27.15
Elexicon Veridian Zone	$27.07[6]
Enwin Utilities	$26.25
Kingston Hydro	$25.96
London Hydro	$25.50[7]
Alectra Brampton Zone	$24.71
Oshawa PUC	$24.67
Alectra Enersource Zone	$24.66
Kitchener / Wilmot Hydro	$22.48

[2] Source: OEB annual rate orders.
[3] Toronto Hydro posts a rate of $38.34 per 30 days. This has been converted to a rate per month for purposes of this chart as follows: ($38.34 per 30 Days) / (30 * 366 days per year) / (12) = $38.98.
[4] The acquired LDCs are Norfolk Power, Haldimand County Utilities, and Woodstock Hydro.
[5] Effective November 1, 2020.
[6] Effective May 1, 2020.
[7] Effective May 1, 2020.

Ontario Energy Board

Application of Cost Allocation for Electricity Distributors

Report of the Board

EB-2007-0667

November 28, 2007

4 Other Rate Matters

4.1 Other Rate Matters

The review of the informational cost allocation filings considered other rate design matters. This section discusses the treatment of the fixed rate component (Monthly Service Charge ("MSC")) of the distribution rate as well as metering credits for the USL Class, transformer credits for customer-owned transformers, and charges for the provision of standby power for customers with load displacement generation.

4.2 The Monthly Service Charge

4.2.1 Lower Bound for the Monthly Service Charge

The Discussion Paper proposed that the floor for the MSC be the avoided costs. Staff's rationale for this proposal was that these costs are not subject to other cost allocation judgments (such as the minimum plant) and therefore there can be a higher level of confidence in the associated outcomes. These are costs defined as meter-related, billing, and collection costs. Many participants agreed with this proposal. One participant commented that the costs associated with a service drop should also be included in the avoided cost calculation. The Methodology was specific about the definition of avoided costs and the Board is not persuaded to depart from that definition at this time. The Board remains of the view that the use of avoided costs, as defined in the Methodology, is an appropriate basis for establishing the minimum or floor amount for the MSC at this time.

4.2.2 Upper Bound for the Monthly Service Charge

The Methodology set a ceiling for the MSC based on the avoided costs plus the allocated customer costs. The Discussion Paper proposed that the ceiling for the MSC be 120% of this level. Some participants believed that the results of the sensitivity analysis were not an appropriate basis for setting an upper bound. The Board considers it to be inappropriate to make significant changes to the ceiling for the MSC at this time, given the number of issues that remain to be examined. The appropriateness of the methodologies cited above, used to set the MSC is an issue that will be examined within the scope of the Rate Review. The Rate Review will also examine the role of rate design in achieving various objectives, including conservation of energy. Both of these undertakings will have determinative impacts on the fixed/variable ratio policy.

In the interim, the Board does not expect distributors to make changes to the MSC that result in a charge that is greater than the ceiling as defined in the Methodology for the MSC. Distributors that are currently above this value are not

required to make changes to their current MSC to bring it to or below this level at this time.

4.3 Certain Specific Credits and Charges

The following were identified in the Methodology as questions to be addressed through the review of the informational filings:

1. Should one provincial rate be set for a metering credit for USL?
2. Should one province-wide rate be set for a transformer credit for customers that own their own transformers?
3. Should one province-wide rate be set for a load displacement generation standby charge?

The cost allocation model was designed to specifically determine these rate components on a distributor-specific basis, with the intent of being able to reflect each distributor's costs as opposed to having one standard credit or charge for all distributors.

The Discussion Paper indicated that the setting of an average province-wide value would not be appropriate, principally due to the variability in the results using the cost allocations. Most participants commented that these credits and charges should be determined on a distributor-by-distributor basis.

These credits and charges are expected to be the subject of review as part of the Rate Review. In addition, the standby charge for customers with load displacement generation facilities is also being considered as part of the current initiative regarding distributed generation rates, rate classification and the recovery of connection costs for distributed generation (consultation process EB-2007-0630).

Given the variability of the results and the fact that these credits and charges are the subject of either or both of the above-noted ongoing initiatives, the Board does not consider it appropriate to set a province-wide rate for any of these three items at this time. In the interim, these credits and charges will continue to be set on a case-by-case basis.

5 Implementation

The cost allocation policies reflected in this Report should be followed by distributors whenever they apply for rates on a cost of service basis. To the extent that the application of these cost allocation policies results in a significant shift in the rate burden amongst classes relative to the status quo, distributors should be prepared to address potential mitigation measures. Except as noted below, these cost allocation policies will not apply in relation to applications for rate adjustments based on the Board's incentive regulation mechanism ("IRM").

The Board recognizes that some distributors whose rates will be rebased for 2008 will have filed their rate applications prior to the issuance of this Report while others should be filing soon. However, the Board does not expect that there are significant practical impediments to applying the cost allocation policies to these cost of service applications. The policies do not affect a distributor's overall revenue requirement calculation. In addition, the Board's *Filing Requirements for Transmission and Distribution Applications*[3] already provide for the filing of a completed cost allocation study based on updated forecast year data, and distributors have for some time had a model that they can use for that purpose.

Updating and applying cost allocations in a manner that reflects the cost allocation policies set out in this Report should therefore not, in most cases, require a significant incremental effort by distributors. To the extent that it is determined by the Board that accommodation of these policies is impractical in any given case and can reasonably be deferred, the cost allocation issue may be addressed in the context of the distributor's 2009 IRM rate application.

[3] Available on the Board's website at http://www.oeb.gov.on.ca/html/en/industryrelations/rulesguidesandforms_regulatory.htm#filreq

INTERROGATORY RESPONSE - EPRF-107

7-EP-4

EXHIBIT REFERENCE:

Exhibit 7, Tab 1, Schedule 1, Table 1; Exhibit 7, Tab 1, Schedule 1, Attachment B, Tables 6-8

SUBJECT AREA: Cost Allocation

Preamble:

The Elenchus CA result shows GS<50 kw to be materially above the recommended range and GS>50kw below the recommended range.

Please explain the rationale for proposing only a marginal reallocation/increase to the GS>50kw class.

RESPONSE:

Hydro Ottawa is interpreting the question as referring to the Large Use customer class which falls below the lower bound for its rate class.

Please see pages 9-12 of Attachment 7-1-1(B): Hydro Ottawa Cost Allocation Report for a discussion of the methodology utilized to bring all customer rate classes within their approved revenue-to-cost ranges.

OEB guidelines state that the revenue-to-cost ratios for customer classes should be brought to within the OEB-approved revenue-to-cost ratio ranges taking into consideration the bill impact to all customers. Bringing the Large Use rate class to within the lower bound of its rate class minimizes the bill impact on all customers while conforming to OEB guidelines.

INTERROGATORY RESPONSE - EPRF-108

8-EP-1

EXHIBIT REFERENCE:

Exhibit 8, Tab 7, Sch. 1, Table 1, page 2

SUBJECT AREA: Specific Service Charges

Please add a 2019 column to Table 1 for 2019 showing current service charges and file it.

RESPONSE:

As stated in Exhibit 8-7-1: Specific Service Charges, Table 1 summarizes the approved 2020 specific service charges ("SSCs") and the proposed revised and new SSCs, respectively, for the years 2021-2025. All of the proposed SSCs are to be included in Hydro Ottawa's Tariff of Rates and Charges.

Table A below has updated Table 1, so as to include 2019 historical service charges.

Dry Core Transformer Charges (effective as of January 1, 2019) have been provided in Attachment EPRF-108(A).

Table A – Revised Specific Service Charges (Inclusive of 2019 Historical Charges)

	2019	2020	2021	2022	2023	2024	2025
Customer Administration							
Account Certificate	$15.00	$15.00	$0.00	$0.00	$0.00	$0.00	$0.00
Arrears Certificate	$0.00	$0.00	$16.00	$16.00	$17.00	$17.00	$17.00
Easement Certificate for Unregistered Easements	$0.00	$0.00	$25.00	$26.00	$27.00	$27.00	$28.00
Duplicate Invoices for Previous Billing	$15.00	$15.00	$5.00	$6.00	$6.00	$6.00	$6.00
Special Billing Service, per hour	$102.00	$104.00	$122.00	$126.00	$129.00	$132.00	$135.00
Credit Reference/Credit Check (+ credit agency costs)	$15.00	$15.00	$16.00	$16.00	$17.00	$17.00	$17.00
Unprocessed Payment Charge (+ bank charges)	$15.00	$15.00	$25.00	$26.00	$27.00	$27.00	$28.00
Account Set Up Charge/Change of Occupancy Charge	$30.00	$30.00	$25.00	$26.00	$27.00	$27.00	$28.00
Reconnect at Meter (New Account):							
Regular Hours	$65.00	$65.00	$67.00	$69.00	$71.00	$72.00	$74.00
After Regular Hours	$185.00	$185.00	$100.00	$103.00	$106.00	$108.00	$111.00
Interval Meter - Field Reading	$370.00	$378.00	$314.00	$322.00	$330.00	$339.00	$347.00
High Bill Investigation - If Billing is Correct	$227.00	$232.00	$238.00	$244.00	$250.00	$257.00	$263.00
Non-Payment of Account							
Collection of Account Charge - No Disconnection	$30.00/ $0.00[1]	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Reconnect at Meter:							
Regular Hours	$65.00	$65.00	$67.00	$69.00	$71.00	$72.00	$74.00
After Regular Hours	$185.00	$185.00	$100.00	$103.00	$106.00	$108.00	$111.00
Reconnect at Pole:							
Regular Hours	$185.0	$185.00	$250.00	$257.00	$263.00	$270.00	$277.00
After Regular Hours	$415.0	$415.00	$426.00	$437.00	$448.00	$459.00	$470.00
Other							
Temporary Service - Install & Remove							
Overhead - no transformer	$848.00	$866.00	$888.00	$910.00	$933.00	$956.00	$980.00
Underground - no transformer	$1,230.00	$1,256.00	$1,288.00	$1,320.00	$1,353.00	$1,387.00	$1,422.00
Overhead - with transformer	$3,023.00	$3,087.00	$3,164.00	$3,243.00	$3,324.00	$3,407.00	$3,493.00
Specific Charge to Access Power Poles - Wireline	$53.00	$53.00	$45.39	$46.53	$47.70	$48.90	$50.12
Drycore Transformer Charge	EPRF-108(A)	8-7-1 (B)	8-7-1 (B)	8-7-1 (B)	8-7-1 (B)	8-7-1 (B)	8-7-1 (B)
ERF Administration Charge Without Account Set Up[2]	$135.00	$138.00	$142.00	$146.00	$150.00	$153.00	$157.00

[1] In accordance with the OEB's Customer Service Rules Amendments (EB-2017-0183) dated March 14, 2019, the Collection of Account Charge was eliminated effective July 1, 2019.

[2] If a customer requires account set-up, they will also be charged the Account Set Up Charge.

Hydro Ottawa Limited
TARIFF OF RATES AND CHARGES
Effective and Implementation Date January 1, 2019

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2018-0044

Dry Core Transformer Charges

Transformers	No Load Loss (W)	Load Loss (W)	Cost of Transmission and LV per kW	Cost of Energy and Wholesale Market per kWh**	Total Monthly cost of power	Cost of Distribution per kW	Total
Rates			$ 5.2543	$ 0.0869		$ 4.4550	
25 KVA 1 PH, 1.2kV BIL	150	900	$ 0.84	$ 7.90	$ 8.74	$ 0.72	$ 9.46
37.5 KVA 1 PH, 1.2kV BIL	200	1200	$ 1.13	$ 10.53	$ 11.66	$ 0.95	$ 12.61
50 KVA 1 PH, 1.2kV BIL	250	1600	$ 1.44	$ 13.25	$ 14.68	$ 1.22	$ 15.90
75 KVA 1 PH, 1.2kV BIL	350	1900	$ 1.91	$ 18.26	$ 20.17	$ 1.62	$ 21.80
100 KVA 1 PH, 1.2kV BIL	400	2600	$ 2.31	$ 21.23	$ 23.54	$ 1.96	$ 25.49
150 KVA 1 PH, 1.2kV BIL	525	3500	$ 3.05	$ 27.94	$ 30.99	$ 2.59	$ 33.58
167 KVA 1 PH, 1.2kV BIL	650	4400	$ 3.80	$ 34.65	$ 38.45	$ 3.22	$ 41.67
200 KVA 1 PH, 1.2kV BIL	696	4700	$ 4.07	$ 37.09	$ 41.15	$ 3.45	$ 44.60
225 KVA 1 PH, 1.2kV BIL	748	5050	$ 4.37	$ 39.86	$ 44.23	$ 3.70	$ 47.93
250 KVA 1 PH, 1.2kV BIL	800	5400	$ 4.67	$ 42.63	$ 47.30	$ 3.96	$ 51.26
*15 KVA 3 PH, 1.2kV BIL	125	650	$ 0.68	$ 6.50	$ 7.17	$ 0.57	$ 7.75
*45 KVA 3 PH, 1.2kV BIL	300	1800	$ 1.69	$ 15.80	$ 17.48	$ 1.43	$ 18.92
*75 KVA 3 PH, 1.2kV BIL	400	2400	$ 2.25	$ 21.06	$ 23.31	$ 1.91	$ 25.22
*112.5 KVA 3 PH, 1.2kV BIL	600	3400	$ 3.32	$ 31.42	$ 34.74	$ 2.82	$ 37.56
*150 KVA 3 PH, 1.2kV BIL	700	4500	$ 4.02	$ 37.11	$ 41.13	$ 3.41	$ 44.55
*225 KVA 3 PH, 1.2kV BIL	900	5300	$ 5.04	$ 47.30	$ 52.34	$ 4.27	$ 56.61
*300 KVA 3 PH, 1.2kV BIL	1100	6300	$ 6.11	$ 57.66	$ 63.77	$ 5.18	$ 68.95
*500 KVA 3 PH, 95kV BIL	2400	7600	$ 11.60	$ 120.61	$ 132.21	$ 9.83	$ 142.04
*750 KVA 3 PH, 95kV BIL	3000	12000	$ 15.20	$ 152.88	$ 168.08	$ 12.89	$ 180.96
*1000 KVA 3 PH, 95kV BIL	3400	13000	$ 17.06	$ 172.76	$ 189.81	$ 14.46	$ 204.27
*1500 KVA 3 PH, 95kV BIL	4500	18000	$ 22.80	$ 229.32	$ 252.12	$ 19.33	$ 271.45
*2000 KVA 3 PH, 95kV BIL	5400	21000	$ 27.19	$ 274.68	$ 301.86	$ 23.05	$ 324.92
*2500 KVA 3 PH, 95kV BIL	6500	25000	$ 32.65	$ 330.39	$ 363.04	$ 27.68	$ 390.73
*3000 KVA 3PH, 95kV BIL	7700	29000	$ 38.50	$ 390.87	$ 429.37	$ 32.65	$ 462.02
*3750 KVA 3PH, 95kV BIL	9500	35000	$ 47.29	$ 481.58	$ 528.87	$ 40.09	$ 568.96
*5000 KVA 3PH, 95kV BIL	11000	39000	$ 54.32	$ 556.33	$ 610.65	$ 46.06	$ 656.71

No Load and load losses from CSA standard C802-94: Maximum losses for distribution, power and dry-type transformers commercial use.
Average load factor = 0.46 average loss factor = 0.2489

*For non-preferred KVA ratings no load and load losses are interpolated as per CSA standard

** Cost of Energy and Wholesale Market per kWh contains May 1, 2018 RPP Tiered Pricing, WMRS and OESP Pricing effective May 1, 2018

INTERROGATORY RESPONSE - EPRF-109

8-EP-2

EXHIBIT REFERENCE:

Exhibit 8, Tab 7, Sch. 1, Table 2, page 8

SUBJECT AREA: Specific Service Charges

Please explain the reasons for the reduction in the MicroFIT and Net-Metering ERF charge and the FIT ERF charge in 2021 and the increase in the HCI, RESOP, Other ERF charge also in 2021.

RESPONSE:

Hydro Ottawa invested in a partially automated solution for MicroFIT settlement within its customer billing system. Hydro Ottawa also partially automated the excel template that is used for the net-metered customer billing. As a result, the monthly time attributable to administering these groups has remained unchanged since 2015, while the number of customers in the MicroFIT group has grown by 60% and the number of Net Metering contracts has grown from 5 to 64. As a result, the cost attributable to each contract in this Application has decreased, resulting in a lower monthly charge.

The modest reduction to the FIT ERF charge in 2021 is also due to partial automation of the settlement process and associated administrative time attributed to this group. Over the 2016-2020 period, the number of customers has increased by 87%, which, again, has resulted in a lower monthly charge per contract.

Hydro Ottawa is proposing to increase the HCI, RESOP, Other ERF charge in 2021. The associated time administering this group was underestimated in 2015 by 32%. This is a comparatively small group of generation customers. While the number of contracts increased

from 5 to 8 since 2015, the increased attributable costs resulted in an overall monthly rate increase for this customer group.

INTERROGATORY RESPONSE - EPRF-110

8-EP-3

EXHIBIT REFERENCE:

Exhibit 8, Tab 7, Sch. 1, Table 3, page 9

SUBJECT AREA: Specific Service Charges

Preamble:

On November 28, 2019, the OEB released the 2020 Retailer Service Rates, with the inflationary adjustment. Hydro Ottawa has used the OEB-approved 2020 inflation factor of 2.0% to adjust the rate for 2021…

Please explain how Hydro Ottawa used the OEB approved inflation factor of 2.0% to increase the Standard Supply Service Administrative Charge from $0.25 in 2020 to $0.62 in 2021.

RESPONSE:

Hydro Ottawa is proposing to increase the Standard Supply Service Administrative Charge ("SSS Charge") rate to align with the 2021-2025 Retail Services Distributor-consolidated billing monthly charge. Hydro Ottawa has used the OEB-approved 2020 inflation factor of 2.0% to adjust the Retail Services Distributor-consolidated billing for 2021 rather than the SSS Charge, as shown in Table A.

Table A – 2020 Approved and 2021 Proposed SSS and Retail Services Administrative Charges

	2020 Approved	2021 Proposed
Retail Services Distributor-consolidated billing monthly charge	$0.61	$0.62
Standard Supply Service Administrative Charge	$0.25	$0.62

INTERROGATORY RESPONSE - EPRF-111

9-EP-1

EXHIBIT REFERENCE:

Exhibit 9, Tab 1, Schedule 1, Table 4 –Group 2 Accounts for 2021-2025;

Exhibit 9, Tab 1, Schedule 3 - 2.2 Energy East Pipeline

SUBJECT AREA: Deferral and Variance Accounts

Preamble:

1508 Sub-account Energy East TransCanada Pipeline balance of $55,424 on a final basis and to discontinue use of this Account.

a) Please provide details of the costs in this account.

b) What is the Threshold applicable to this account?

c) If the amount is below threshold, why should the balance be disposed of?

RESPONSE:

a) In Sub-Account 1508 - East Energy TransCanada Pipeline[1], the balance Hydro Ottawa is proposing to dispose of consists of two costs passed on from the OEB related to the East Energy Pipeline Project. These costs were $36,003[2] and $14,728[3] in 2015, along with interest from 2015-2019 and projected interest for 2020 of $4,693, for a total of $55,424.

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[1] This is referred to as Sub-Account 1508 - East Energy Cost Defer Cost in UPDATED Attachment 9-1-1(A): OEB Workform - Deferral and Variance Account (Continuity Schedule).

[2] Ontario Energy Board, Letter re: *Decision and Order on Board Costs Associated with Consultations on TransCanada Pipelines Limited's Proposed Energy East Pipeline Project*, EB-2013-0398 (March 25, 2015), Appendix A, page 6.

[3] Ontario Energy Board, Invoice #CA1516Q2045, line - Hearing Cost s.30(1) OEB Act: EB-2013-0398, (July 1, 2015).

b) Please refer to the response provided in interrogatory OEB-177.

c) Please see the response to part (b) above.

INTERROGATORY RESPONSE - EPRF-112

9-EP-2

EXHIBIT REFERENCE:

Exhibit 9, Tab 1, Sch. 3, page 9 and Table 3, page 11

SUBJECT AREA: Deferral and Variance Accounts

Preamble:

The New Facilities Account was established to record the revenue requirement impacts of the costs of the New Facilities and related land that are above $66.0M. Any amount recorded into this account is subject to a prudency(sic) review.

a) Please confirm that the total cost of New Facilities is $99,544,582 consisting of $66,000,000 million plus the $33,544,582 shown in Table 3.

b) Please confirm that Hydro Ottawa is seeking to recover the revenue requirement on the total cost of New Facilities.

c) Please confirm that a prudence review is to be conducted in the current proceeding.

d) For each of the New Facilities please file a table that shows the approved estimate and the actual expenditure for each showing amounts for land, materials, labour, overheads, and interest during construction with variance explanations for each amount.

e) Please file copies of quarterly progress and variance reports that were presented to senior management of Hydro Ottawa during the construction of the New Facilities.

f) Please list specific actions of senior management in response to each quarterly progress and variance report.

RESPONSE:

a) Hydro Ottawa confirms that the total cost of New Facilities is $99,544,582, consisting of $66,000,000 plus the $33,544,582 shown in Table 3.

b) Hydro Ottawa confirms that it is seeking to recover the revenue requirement on the total cost of New Facilities.

c) Hydro Ottawa confirms that a prudence review of New Facilities costs beyond $66M is set to occur in the current proceeding.

d) Please see the responses to interrogatory SEC-30, parts (e) and (f), and to interrogatory VECC-35 part (a). The approved estimate and actual expenditures include land, outside services (including material cost), interest, and overhead as described in the referenced responses.

e) Attached are monthly status reports as presented to the utility's Executive Management Team ("EMT"), and quarterly updates as presented to the Strategic Initiatives Oversight Committee ("SIOC") which is a standing sub-committee of the Board of Directors. These documents have been redacted to remove commercially sensitive and security related matters. The documents are as follows:

- Attachment EPRF-112(A): 2017 Monthly EMT Status Reports
- Attachment EPRF-112(B): 2018 Monthly EMT Status Reports
- Attachment EPRF-112(C): 2019 Monthly EMT Status Reports
- Attachment EPRF-112(D): 2016 Quarterly SIOC Report
- Attachment EPRF-112(E): 2017 Quarterly SIOC Reports
- Attachment EPRF-112(F): 2018 Quarterly SIOC Reports
- Attachment EPRF-112(G): 2019 Quarterly SIOC Reports

f) Actions taken by management are noted in the reports provided in the response to part (e) above.

Executive Status Report

Facility Renewal Program

Date of Report	**January 12, 2017**
Report Period	**November 1 – January 13th, 2017**

Executive Summary

This report covers the period from November 1rst to January 13th, 2017. Monthly status reports will be issued for the duration of the project by the 10th day of following month, commencing March 2017.

The project is on schedule and on budget. $1.4M of savings were realized from the Design Build tender but savings have been forecasted at $.7M (January 017) to reflect minor operational scope changes, design refinements, and HOL budget gaps. The net is $.7M increase in available contingency capital for HOL over the approved budget. However, and despite the contract risk transfer to Sullivan, HOL contingency preservation is imperative at this stage as the project is in "high risk" stage, with 100% design and regulatory approvals not finalized and site conditions not known.

Period efforts have been concentrated on structuring the HOL and Design Build management teams, establishing protocols and control processes for the project and advancing the design development. Sullivan achieved the 50% design review and City Site Plan Control Agreement submission on schedule. The HOL Project Steering Committee has been effective in maintaining the approved scope of the project with only minor operational and security changes sanctioned. Smaller sub-committees and HOL operation focus groups were developed to interface with the Design Builder and lead on HOL Change Management activities. Executive Partnership meetings with Sullivan commenced in November reinforcing executive commitment to the project.

Site Plan approval is scheduled for April, 01 017. The East Campus is the critical path of the project and will start immediately upon approval. South Campus site construction work will commence in April but full construction will not ramp up until Q3 017. Sullivan has managed the regulatory approval requirements effectively. The Sullivan project team is committed and responsive and cohesion as a team has improved significantly. verTerra has increased their PM resources and applied a high degree of management control over Sullivan to ensure compliance to HOL contractual requirements.

The HOL Project Steering Committee with "HOL Champions" is working effectively, particularly since smaller sub-committees have been put in place. Change Management strategies to engage and motivate HOL staff to accept the new workplace environment are in development. Innovative technology solutions will be critical for HOL's operational success and need to be planned for technology trends beyond 2019. Communications in alignment with HOL's values, vision and strategic plan and promoting employee health, wellness, and workplace enjoyment are critical to increase employee acceptance and build excitement of the transition to the new facilities.

Overall, the design build team is now settled in and normalized to the management and scope requirements of HOL. Healthy relationships amongst the team members are strengthening and are success orientated.

Major accomplishments since last report	Upcoming major activities (6 week look ahead)
• 50% design submission completed and reviewed by HOL; • Site Plan Control Agreement submission to the City (public advisory boards in place); • HOL Project Steering Committee and sub-committees developed and operationalized; • Project Management planning, protocols and administrative controls established; • All supporting professionals and management teams assembled under HOL/verTerra	• 75% design submission (Jan. 19th) • Building Permit submission to the City (Jan 23rd) - to commence review while awaiting SPA approval; • 95% Design Submission (Feb 3rd) • Furniture (FF&E) procurement development, release to market • Fitness & Food Service programing and business case development; • HOL asset inventories and migration planning; • HOL internal communication launch • Budget reconciliation with 50/75/95% design –

Executive Status Report

Facility Renewal Program

- Completion of the Road Modification Agreement on the South Campus
- Analysis of relocation the Solar program to the roofs of the Operation building (determined not viable)
- Continuation of the NCC /City legal agreements on the East Campus Access Rd.
- Enbridge High Performance Building Design Charrette (potential 60K savings rebate to HOL)

Sullivan will commence market trade tendering

Significant Risks / Challenges

- Public communication / awareness of the project with political climate;
- Site Plan Control approvals by City of Ottawa and elimination of Development Charge risk entirely;
- Completing the NCC/City East Campus Access rd. agreements;
- Managing HOL program change during design development;
- Technology and Operational change between design and 2019;
- HOL employee engagement (acceptance);
- Managing Design Build team cost and quality compliance;
- Site conditions (both campuses);

Significant Opportunities

- Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated);
- Establishing project milestones and events to celebrate team and project success;
- Integrating Hydro Ottawa's history into the design and branding of the new facilties.

Budget Status

- $23.6M or 24% of the project budget is expended to date inlcuding land;
- $1.4M in savings were realized from the Design Build and post Tender adjustments.
- $.7M in changes are forecasted from the baseline design. These changes relate to HOL managed technology scope increases/gaps, design refinement from the exemplar, HOL programing and operational effectiveness, security and departmental scope change;
- Professional fee increases from the approved budget relate to realloctaed scopes of work from the Design Build contract ie: cash allowances as well as increases for Change Management and Project Management

Budget Summary & Forecast January 13th, 2017:

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	50% Design Forecasted Revisions January 2017	Budget Forecast January 2017	Spent to Date	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 404,700	$ 6,059,992	$ 1,810,546	30%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 300,000	$ 59,087,316	$ 2,458,786	4%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,409,290	$ 6,709,290	$ (704,700)	$ 6,004,590	$ -	0%
	Totals	**$ 95,818,483**	$ 704,215	**$ 96,522,698**		**$ 96,522,698**	**$23,600,332**	24%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		
	Variance	*$ (681,517)*		*$ 22,698*		*$ 22,698*		

Schedule Status

- The project is on schedule;
- Key schedule risk is obtaining Site Plan Agreement approvals and early work permits to commence construction mobilization in March 017

Miletsone Schedule & Status January 13th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission to HOL	Jan. 19 -017	in progress
Buidling Permit Submission to City	Jan. 23-017	in progress
95% Design Submission to HOL	Feb. 23-17	
Site Plan Agreement Approvals/ Early Work Permits	Mar. 22- 017	
Construction Mobilization - East Campus	Mar. 23 -17	
Construction Mobilization - South Campus	April 13-107	
East Campus Early Occupancy	January 019	
Substantial Completion & HOL Occupancy	May 1-019	
Final Completion	June 26-019	

Executive Status Report

Facility Renewal Program

Date of Report	**February 10th, 2017**
Report Period	**January 13th – February 10th, 2017**

Executive Summary

This report covers the period from January 14th to February 10th, 2017 and is an interim update to enable us regulate the reporting cycle to a full monthly basis moving forward.

There is no change to scheduled completion date of May 2019, however the 95% design development schedule may be elongated at the request of Sullivan to permit them more time complete submissions. There is no change to budget from last month's report; the project remains forecasted under budget with a $5.8M contingency unallocated, however additional minor operational changes have been identified by HOL through the 75% design review process which are being analyzed by verTerra and Sullivan. The project is 25% complete based on billings ending January 31rst, 2017.

Significant to this interim period was the receipt of the City's planning comments received for the East Campus. A minor variance will be required due to the height of the EC1 (Administration Bldg.) being over the allowable 18M at the front sector of the building. The East Campus property has two distinct zoning requirements, IH (Heavy Industrial) and IL (Light Industrial) each with different allowable building heights, 22M for the IH zone and 18M for the IL zone. The zones bisect the EC1 building with the IL zone covering a small percentage of the front of the EC1 building. Based on the design submitted by Sullivan they exceed the 18M allowable height by 2M at the atrium and a small portion of the 4th floor Control Centre. verTerra and Sullivan met with the City Planner to justify an exception without need for minor variance but the City could not support non-adherence to zoning regulations. Application to the City of Adjustment was promptly made and a hearing date at the Committee of Adjustment is set for March 15th. The minor variance will be supported by the City staff as a higher building facing Hunt Club enhances the urban presence and has no impact on the adjacent properties. We forecast no delay to the project schedule, as early works on the East Campus can proceed as planned in late March. [redacted]

There were no other major issues from the City's comments, but final conditions of approval remain to be drafted by the City or the NCC. A resubmission to the City addressing all received comments will be submitted by Sullivan this week.

An update meeting with Ward Councillor Dean's occurred on February 8thand she was pleased with the project and the design, her only substantive concern was the increased traffic flow onto Hunt Club. She waived the requirement to conduct a formal Public Consultation, replacing it with an update presentation to the local Community Association. This benefits the project, alleviating the 30 day public objection period, accelerating Site Plan Approval, and saving the Public Consultation fees carried. No mention of Development charges, or Cash in Lieu, were made by Councillor Deans or the City Planning department.

South Campus planning comments from the City were also received and a resubmission will be required as Sullivan failed to provide all of the requisite data specifically by the Rideau Valley Conservation Authority.

Sullivan has committed to bolster their team resources and administrative control on the project and will add an additional Project Manager, Project Coordinator and Field Superintendent (in advance of construction). Design management by Sullivan has improved but fragmentation between their two Architectural firms still occurs. verTerra will continue to monitor closely with HOL.

Change Management developments this period include the release of HOL's internal website on the project, commencing the employee engagement in earnest. Technical planning for technology, Security and operational migration strategies continue. The issuance of the Furniture RFP has been extended to March without impact to the project.

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- 75% design submission of East Campus Admin. Bldg., completed and reviewed by HOL;
- Building permit submission to City Building department for the East Campus Admin. Bldg.;
- Site Plan Control Agreement comments received from the City on both Campuses;
- 75% design submission Operational Bldgs. EC2, EC3 and South Campus – (Feb. 9th)
- Analysis of relocation the Solar program to the roofs of the Operation building (determined not viable)
-

Upcoming major activities (4 week look ahead)

- Resubmission of SPA documents for the East Campus Admin. Bldg., with all response data required by City
- 95% design submission for all buildings (may extend to March);
- Furniture (FF&E) RFP draft for HOL supply review;
- Continuation of the NCC /City legal agreements on the East Campus Access Rd.
- Budget reconciliation with 75% design
- HOL Solar design commencement

Significant Risks / Challenges

- Public communication / awareness of the project with political climate;
- Completing the NCC/City East Campus Access rd. agreements;
- Managing HOL program change during design development;
- Technology and Operational change between design and 2019;
- HOL employee engagement (acceptance);
- Managing Design Build team cost and quality compliance;
- Site conditions (both campuses);

Significant Opportunities

- Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated);
- Establishing project milestones and events to celebrate team and project success;
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 25% complete
- $24.06M is expended to date including land
- $5.77M in unallocated project contingency

Budget Summary & Forecast February 14th, 2017:

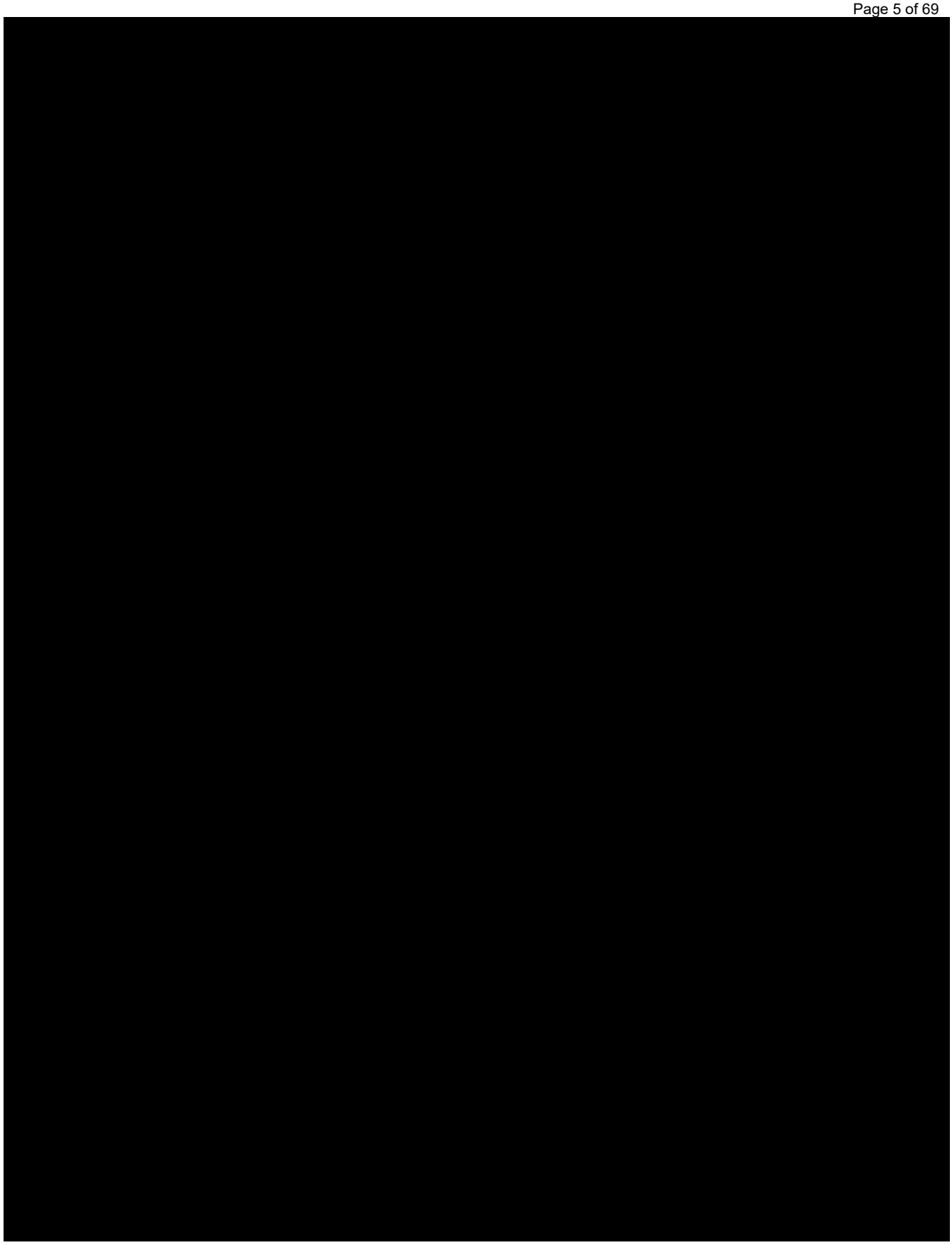
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	50% Design Forecasted Revisions January 2017	Budget Forecast January 2017	Spent to Date	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 404,700	$ 6,059,992	$ 1,869,786	31%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 506,000	$ 59,293,316	$ 2,860,162	5%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (910,700)	$ 5,775,892	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$24,060,948**	25%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

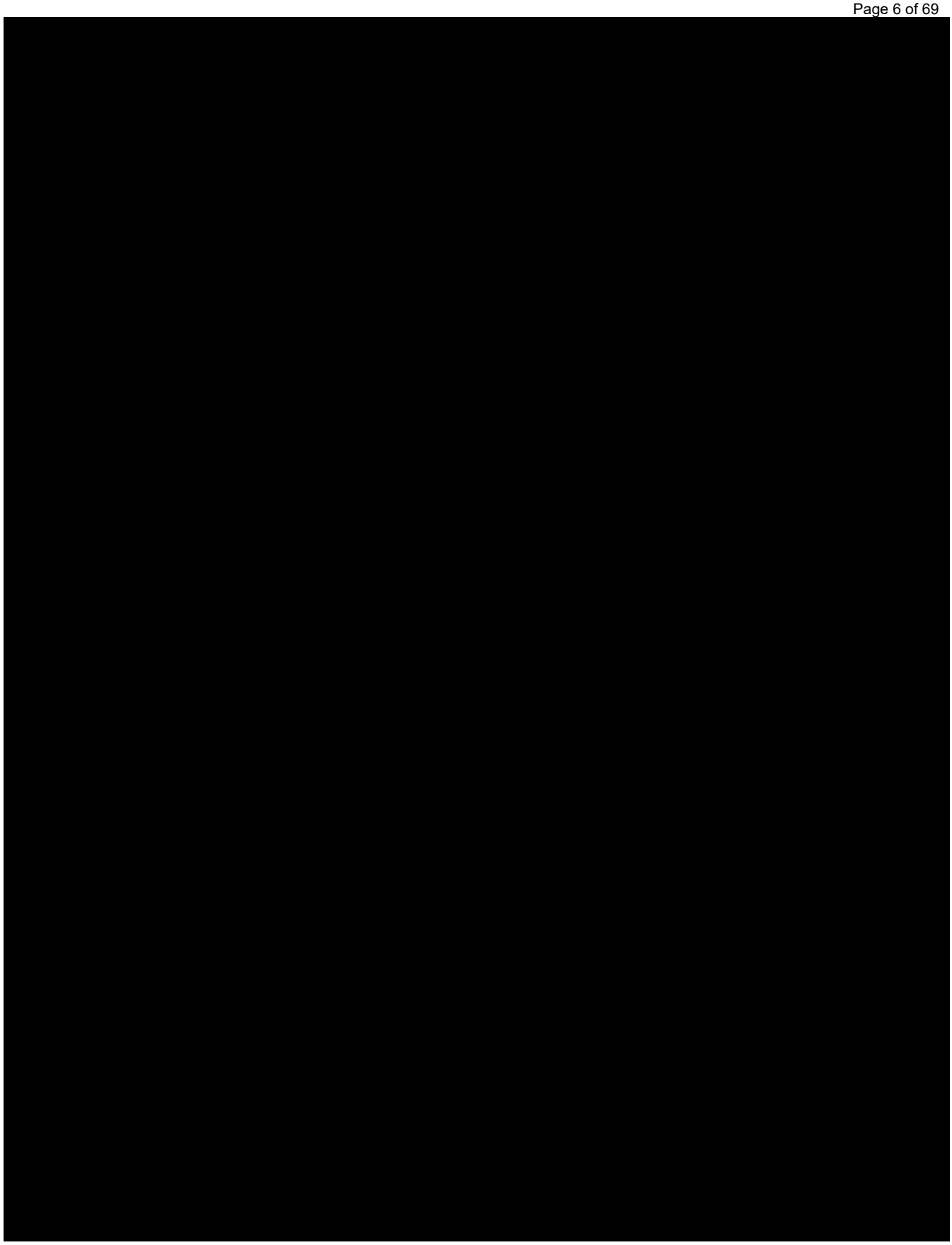
Schedule Status

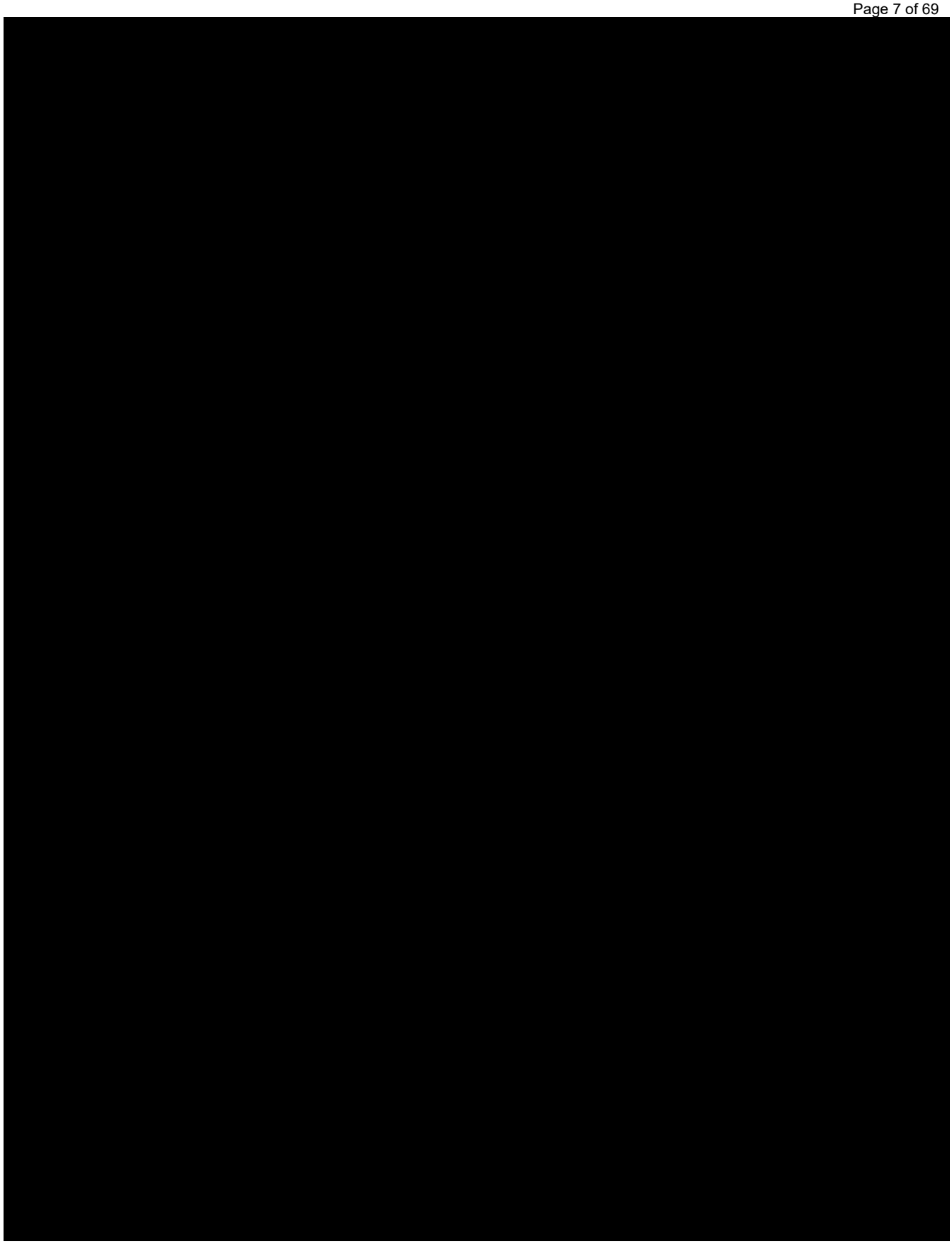
- The project is on schedule
- Committee of Adjustment Hearing added to plan – March 15th, 2017
- The 95% design submission schedule is under review by Sullivan.
- Key schedule risk is obtaining Site Plan Agreement approvals and early work permits to commence construction mobilization in March 017.

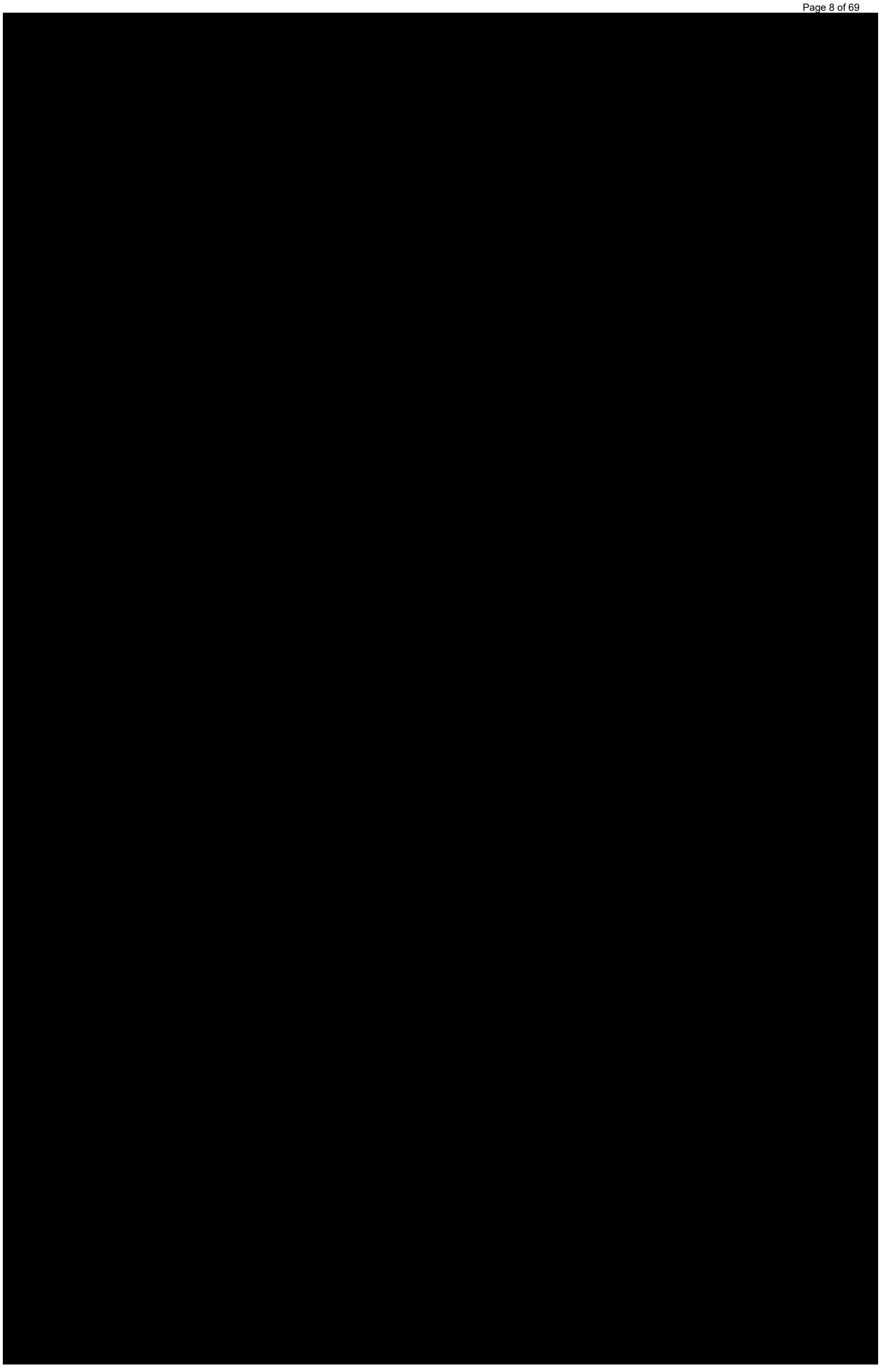
Milestone Schedule & Status January 13th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission EC1 to HOL	Jan. 19 -017	100% complete
Building Permit Submission to City	Jan. 23-017	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Feb. 9-017	100% complete
95% Design Submission to HOL	Feb. 23-17	under review
Committee of Adjustment Hearing EC1 Height	Mar. 15-017	
Site Plan Agreement Approvals/ Early Work Permits	Mar. 22- 017	
Construction Mobilization - East Campus	Mar. 23 -17	
Construction Mobilization - South Campus	April 13-107	
East Campus Early Occupancy	January 019	
Substantial Completion & HOL Occupancy	May 1-019	
Final Completion	June 26-019	









Executive Status Report

Facility Renewal Program

Date of Report	**March 17th, 2017**
Report Period	**February 10th to March 15th , 2017**

Executive Summary

This report covers the period from February 10th, to March 15th, 2017.

There is no change to scheduled completion date of the project of May 2019, however the design submission schedule has been revised. The 75% design submission for the Operation Buildings (EC2, EC3 and the South Campus) submitted by Sullivan February 9th was deemed materially non-compliant by verTerra and rejected. The rejection was based on the absence of a complete structural design (the Pre-engineered building structures were not finalized), substantive design coordination issues and missing submission materials. Sullivan agreed with the rejection and will be resubmitting the 75% submission in accordance to the prescribed contract requirements on March 23rd. The 95% design submission has also been extended to April 13th to permit a comprehensive submission for both East and South Campuses. Theses schedule revisions do not impact the regulatory approvals and permitting or the commencement of the early works scheduled for late March/early April.

The project remains forecasted under budget with a $5.8M contingency unallocated, however additional minor operational changes have been identified by HOL through the 75% design review process which are being analyzed and finalized by verTerra and Sullivan. The project is 25% complete based on billings ending February 28th, 2017.

Key developments for this period were:

- Completion a public presentation to the Hunt Club Community Association on February 28th, as was requested by Councillor Dean's. The meeting was well received by the Community Association and Councillor and no substantive issues arose;
- Approval, without issue, by the City's Committee of Adjustment on the Minor Variance of the East Campus Administration Bldg., height exceedance, on March 15th;
- Finalization of the traffic control requirements and conditions with the City's Planning department that permit HOL an emergency left turn exit from the 2nd access on the East Campus.
- Advancement of the NCC/City/HOL future access road legal agreements and acceptance to not delay Site Plan Control issuance on the East Campus (final conditions are expected to be in alignment with the executed Term Sheet)

Sullivan plans to respond to the final (minor) planning comments on the East Campus next week to permit the City to prepare a delegated authority report for approval by the Councillor by the end of March. Final Site plan approval for the East Campus is forecast by the end of April. Sullivan has been delayed in responding to the City's initial Site Plan comments on the South Campus and in submitting a building permit application for the South Campus– this matter was escalated by verTerra to Sullivan Management – and submission now planned for the week of March 20th.

Sullivan's team management concerns continue, specifically on cohesion of the design team and completion of accurate deliverables. verTerra has now implemented weekly issue meetings with Sullivan to track all project requirements.

There were no substantive new developments this period on the Change Management aspects of the project.

HydroOttawa

Executive Status Report

Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (6 week look ahead)

• Completion of the Community Association meeting for the East Campus;
• Approval of the Minor Variance by the Committee of Adjustment;
• Finalization of Site Plan traffic conditions for HOL's East Campus emergency exit;
• Closure of the NCC comments on the East Campus Site Plan agreement and advancement of the legal agreements;
• Non-compliance rejection of the 75% design submission Operational Bldgs. EC2, EC3 and South Campus by verTerra
• Building permit review responses by Sullivan on East Campus (EC1)
• Responses to East Campus Site plan comments by City
	• Final resubmission of SPA documents for the East Campus Admin. Bldg.,
	• Site Plan Delegated Authority report by City for East Campus;
	• Site Plan Agreement East Campus (end of April);
	• Application to MOE for East Campus;
	• Construction mobilization on East Campus;
	• 75% Design resubmission for Operational Bldgs. EC2, EC3 and South Campus;
	• 95% design submission for both Campuses;
	• Mobilization and clearing of South Campus;
	• Furniture (FF&E) RFP draft for HOL supply review;
	• Finalization of the NCC /City legal agreements on the East Campus Access Rd.
	• HOL Solar design commencement
	• Sullivan sub-trade tendering of
	  o Plumbing & Sprinklers
	  o Concrete formwork & Reinforcing
	  o Site Clearing
	  o Fencing
	• 75% design budget reconciliation

Significant Risks / Challenges	**Significant Opportunities**
• Sullivan's design team cohesion and deliverable management; • Managing HOL program change during design development; • Technology and Operational change between design and 2019; • HOL employee engagement (acceptance); • Managing Design Build team cost and quality compliance; • Site conditions (both campuses);	• Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated); • Establishing project milestones and events to celebrate team and project success; • Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Executive Status Report

Facility Renewal Program

Budget Status

- 25% complete
- $24.36M is expended to date including land
- $5.77M in unallocated project contingency

Budget Summary & Forecast March 15th, 2017:

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	50% Design Forecasted Revisions January 2017	Budget Forecast January 2017	Spent to Date	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 404,700	$ 6,059,992	$ 1,923,590	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 506,000	$ 59,293,316	$ 3,110,814	5%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (910,700)	$ 5,775,892	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$24,365,404**	25%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is on schedule
- Committee of Adjustment Hearing added to plan – March 15th, 2017
- The 95% design submission schedule is under review by Sullivan.
- Key schedule risk is obtaining Site Plan Agreement approvals and early work permits to commence construction mobilization in March 017.

Milestone Schedule & Status March 15th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission EC1 to HOL	Jan. 19 -017	100% complete
Building Permit Submission to City	Jan. 23-017	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15-017	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23-17	revised date
95% Design Submission to HOL	April 13th-17	revised date
Site Plan Agreement Approvals/ Early Work Permits	April 15/30th	revised date
Construction Mobilization - East Campus	Mar. 27 -17	revised date
Construction Mobilization - South Campus	April 13-107	
East Campus Early Occupancy	January 019	
Substantial Completion & HOL Occupancy	May 1-019	
Final Completion	June 26-019	

Executive Status Report

Facility Renewal Program

Report #	**4**
Date of Report	**April 15th, 2017**
Report Period	**March 15th to April 15th, 2017**

Executive Summary

This report covers the period from March 15th to April 15th, 2017.

The project is on schedule and forecasted to be on budget with $5.4M of contingency remaining unallocated.

Two significant developments occurred this period :

1. Sullivan commenced construction on both the east and south sites March 27th, 2017 as scheduled;
2. The City of Ottawa retracted their request for Parkland Dedication on the East Campus Site Plan Agreement - a cost avoidance of $450,000. In so doing, the $4M Development Charge risk is permanently eliminated.

There is no change to scheduled completion date of the project of May 2019. The 75% design submission for the Operation Buildings (EC2, EC3 and the South Campus) – previously rejected by verTerra – was resubmitted March 23rd, and the 95% design submission for the all facilities submitted April 13th, 2017. Site Plan Agreement finalization is near completion for the East Campus, including the NCC easement release, but remains a critical risk to schedule if delayed beyond April.

The project remains forecasted under budget with $5.4M contingency unallocated. The project is 26% complete based on billings ending February 28th, 2017. The majority of HOL scope changes have been captured in the 75% design review and are included in this period's budget forecast. The potential for unknown site conditions, specifically on the East Campus, remains a significant cost risk, however this will be exposed over the next two months as construction advances.

Sullivan's Senior management met with verTerra to address concerns on Sullivan's deliverable management and design team cohesion. Sullivan committed to resolving all concerns and have brought additional resources to the project. verTerra and Sullivan will consolidate their project management resources on the East Campus site and continue weekly and bi-weekly control meetings which will improve team efficiency and coordination.

The Project Steering Committee meetings have been set at a monthly interval as verTerra has commenced Operational Integration and Migration meetings with HOL to commence the detailed planning of HOL's operational move into the new facilities. The Change Management sub-committee continues on developing strategies for employee engagement and acceptance of the changes to HOL's workplace environment – a key success factor and risk to the project.

Major accomplishments since last report	Upcoming major activities (6 week look ahead)

• Construction commenced March 27th on both the East and South Campuses
  o Trailer, temporary road, fencing
  o Tree clearing of South Campus
• City retracted the Parkland Dedication condition from the Site Plan Agreement on the East Campus
• NCC easement condition resolved for East Campus Site Plan Agreement
• Final Site Plan Agreement conditions being prepared by City (all conditions now accepted)
• Application to MOE submitted for East Campus
• 75% design re-submitted for OPS buildings
	• Site Plan Delegated Authority report by City for East Campus;
	• Site Plan Agreement East Campus (end of April);
	• Application to MOE for East Campus;
	• Foundation construction permits from City
	• HOL review and completion of 95% design process for both Campuses;
	• Furniture (FF&E) RFP draft for HOL supply review;
	• Finalization of the NCC /City legal agreements on the East Campus Access Rd.
	• HOL Solar program development with Sullivan
	• Continued Construction:

Executive Status Report

Facility Renewal Program

- 95% design submitted for both Campuses
- Sullivan sub-trade awards to Plumbing, Sprinkler, Concrete formwork, reinforcing steel, trade contractors
  - Dynamic compaction pad (East Campus)
  - Tower Crane erection (East Campus)
  - Grading and ditching (both campuses)
  - Moodie Drive road improvement finalization (South Campus)

Significant Risks / Challenges

- Unknown Site conditions (both campuses)
- Finalizing the East Campus Site Plan Agreement to secure construction permits
- Managing HOL program change during design development;
- Technology and Operational change between design and 2019;
- HOL employee engagement (acceptance);
- Managing Design Build team cost and quality compliance;

Significant Opportunities

- Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated);
- Establishing project milestones and events to celebrate team and project success;
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 26% complete
- $24.86M is expended to date including land
- $3.6M (6%) of Design Build contract spent to date
- $5.4M in unallocated project contingency

Budget Summary & Forecast April 15th, 2017:

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	75% Design Forecasted Revisions March 2017	Budget Forecast April 2017	Spent to Date March 31rst, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 491,200	$ 6,146,492	$ 1,923,590	31%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 777,982	$ 59,565,298	$ 3,606,157	6%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (1,269,182)	$ 5,417,410	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$24,860,747**	26%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is on schedule and 14% complete
- The 95% design submission was achieved April 13th
- Key schedule risk is finalizing the East Campus Site Plan Agreement approval and early work permits

Milestone Schedule & Status April 15th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission EC1 to HOL	Jan. 19 -017	100% complete
Building Permit Submission to City (East Campus)	Jan. 23-017	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15-017	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23-17	100% complete
Building Permit Submission to City (South Campus)	Mar. 24-17	100% complete
Construction Mobilization - East Campus	Mar. 27-017	100% complete
Construction Mobilization - South Campus	Mar 27-017	100% complete
95% Design Submission to HOL	April 13-17	100% complete
Site Plan Agreement Approvals/ Early Work Permits	April 15/30-017	*in progress*
East Campus Early Occupancy	Jan-019	
Substantial Completion of DB Contract	May 2-019	
Final Completion of DB Contract	June 26-019	
HOL Operational	July 2-019	

HydroOttawa

Executive Status Report

Facility Renewal Program

Site Photos:

South Campus Aerial – trees cleared

South Campus: access road, trailer and tree mulching (for reuse)

HydroOttawa

Executive Status Report

Facility Renewal Program

East Campus – grading/excavation

East Campus: Access road (west perimeter), storm water ditching

Executive Status Report

Facility Renewal Program

Report #	**5**
Date of Report	**May 15th, 2017**
Report Period	**April 15th to May 15th, 2017**

Executive Summary

This report covers the period from April 15th to May 15th, 2017.

The project is on schedule and forecasted to be on budget.

Two significant developments occurred this period greatly reducing the risk profile of the project:

1. Site Plan Approval (Delegated Authority Report) for the East Campus was approved by Councillor Deans on May 3rd – this allows the building permit to be issued by the City mitigating delay risk for the East Campus;
2. Sullivan advanced excavation all areas of the East Campus site and exposed minimal contaminated/ unsatisfactory soil conditions.

The 95% design submission for both East and South Campuses was submitted April 13th with no significant compliance deficiencies. A two day final compliance review with Sullivan is scheduled for late May. 100% design (for construction drawings) is scheduled for late June which will complete the design phase of the project.

The project is 27% complete based on billings ending April 30th, 2017. verTerra has revised the budget forecast based on the 95% design review, HOL changes and the East Campus site conditions resulting in a $300K increase to contingency spending from last period. $5.1M in contingency, or 8.4% (over construction).

Sullivan's team performance and communication greatly improved during this period and all project/construction management resources are now consolidated at the East Campus site headquarters. Sullivan has advanced tendering the major structural trades for the project and construction work to date has been ahead of schedule – despite the wet weather. Safety to date is excellent with no lost time accidents over 34 days of on-site construction (both campuses).

The Operation Integration and Migration committee is now fully engaged and detailed planning under development for HOL's move into the new facilities. The Change Management sub-committee has advanced employee engagement actions, with multiple employee focus sessions scheduled for June.

Major accomplishments since last report	Upcoming major activities (6 week look ahead)

• East Campus SPA/ Delegated Authority Report received May 3rd – a major milestone!
• NCC/City easement terms and conditions closed between parties – final documentation being prepared
• 95% design complete for the entire project
• Full mobilization and set up of East Campus Site HQ
• East Campus site excavation completed for EC1, EC2 and EC3 – no major soil risk realized
• Dynamic Compaction (EC2) commenced (preconstruction surveys completed)
• Sullivan sub-trade awards to date:
  o Electrical, Pre-Engineered Bldgs., Plumbing, Sprinklers, Concrete formwork, reinforcing steel, concrete supply, granular supply (east only), Bridge cranes
• Moodie Drive road improvements tendered and under
	• Building Permit East Campus (May 24th)
	• South Campus Site Plan Approval
	• Compliance reviews of 95% design;
	• 100% design documents (late June)
	• Execute NCC /City legal agreements on the East Campus Access Rd.
	• HOL Solar program development with Sullivan
	• Continued Construction:
	  o Complete Dynamic compaction (East Campus)
	  o Tower Crane erection (East Campus)
	  o Grading and ditching (both campuses)
	  o Moodie Drive road improvement (South Campus)
	  o Complete South Campus land clearing
	• Site Observation cameras for HOL on-line viewing

Executive Status Report

Facility Renewal Program

budget

- Employee Engagement sessions for Workplace environment, Food Services and Fitness Survey.
- Signage design development

Significant Risks / Challenges

- Unknown Site conditions (south campus)
- Managing HOL program change during design development;
- Technology and Operational change between design and 2019;
- HOL employee engagement (acceptance);
- Managing Design Build team cost and quality compliance;

Significant Opportunities

- Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated);
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 27% complete
- $25.6M is expended to date including land
- $4.3M (7%) of Design Build contract billed to date
- $5.1M in unallocated project contingency

Budget Summary & Forecast May 15th, 2017:

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	95% Design Forecasted Revisions April 2017	Budget Forecast May 15th 2017	Spent to Date April 30th, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 491,200	$ 6,146,492	$ 1,970,534	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 1,129,678	$ 59,916,994	$ 4,274,719	7%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (1,620,878)	$ 5,065,714	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$25,576,253**	27%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is on schedule
- The 95% design submission was achieved April 13th
- East Campus Site Plan Agreement approval from Councillor Deans was received May 3rd
- East Campus Building Permit forecast by May 24th (no delay anticipated)

Milestone Schedule & Status May 15th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission EC1 to HOL	Jan. 19 -017	100% complete
Building Permit Submission to City (East Campus)	Jan. 23-017	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15-017	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23-17	100% complete
Building Permit Submission to City (South Campus)	Mar. 24-17	100% complete
Construction Mobilization - East Campus	Mar. 27-017	100% complete
Construction Mobilization - South Campus	Mar 27-017	100% complete
95% Design Submission to HOL	April 13-17	100% complete
Site Plan Agreement Approval - East Campus	May 3rd-2017	100% complete
Building Permit - East Campus	May 24th, 2017	*in progress*
Site Plan Approval - South Campus	June 23rd, 2017	*in progress*
Building Permit - South Campus	July 7th, 2017	*in progress*
East Campus Early Occupancy	Jan-019	
Substantial Completion of DB Contract	May 2-019	
Final Completion of DB Contract	June 26-019	
HOL Operational	July 2-019	

Site Photos:

East Campus – Excavation EC1 Main Administration Bldg.

East Campus – Excavation and placement of granular pad for EC2

HydroOttawa

Executive Status Report

Facility Renewal Program

East Campus –Granular pad for EC2

East Campus – Dynamic Compaction EC2 building

HydroOttawa

Executive Status Report

Facility Renewal Program

East Campus – west perimeter stormwater drainage ditching

South Campus: Land clearing

Executive Status Report

Facility Renewal Program

South Campus: Storm water ditching

Executive Status Report

Facility Renewal Program

Report #	**6**
Date of Report	**June 15th, 2017**
Report Period	**May 15th – June 15th, 2017**

Executive Summary

The project is on schedule and forecasted to be on budget.

The design-build project team morale is high with the commencement of construction and near completion of the design process. HOL's Project team advanced the Change Management processes with departmental employee engagement sessions, amenity area focus sessions and Operational Migration meetings to develop a comprehensive and integrated strategy to successfully move into the facilities in 2019.

The 95% design reviews are now completed. 100 % design completion has been extended to July based on verTerra's compliance reviews and finalization of HOL equipment locations.

The release of the EC1 building permit delayed by the City of Ottawa legal as they suddenly questioned HOL's Development Charge exemption despite confirmed written exemption from City planning and an approved Delegated Authority Report /SPA without conditions to pay DC charges. This matter was solved immediately with HOL's CEO and Legal involvement and a "deferral" agreement executed with the City which allowed the release of the building permit but it did delay the tower crane erection and concrete foundations on EC1. The permit was received June 14th, 2017 – the permit is conditional for 60 days pending legal execution of the Site Plan Control Agreement (insurances, fees, and securities).

The EC2 and EC3 building permits remain in technical review with the City and Sullivan and are forecast for completion by the end of June. The final SC SPA comments from the City have been responded too and forecast completion is now mid-July.

Construction activities have advanced on both campuses, with Dynamic Compaction on the east campus now complete. Some soils risk remains on both campuses but has been largely mitigated.

The project is 27% complete based on billings ending April 30th, 2017. verTerra has revised the budget forecast based on the 95% design review, HOL operational changes and the East Campus site conditions resulting in a $600K increase to contingency spending from last period. $4.8M in contingency, or 6.5% of budget (less land and contingency).

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• East Campus building permit received June 14th;
• 95% design complete for the entire project
• Dynamic Compaction on East Campus completed
• Sullivan sub-trade tenders closed:
  o Roofing, glass and curtainwall, metal panels, masonry
• Change Management Employee Focus Sessions completed (6 departments)
• Interior Design Focus Session
• Food Service Employee Focus session.
• Solar program launched – both campuses.
• EC1 crane base poured and foundation excavation
• Real time video cameras installed – both sites.
	• South Campus Site Plan Approval
	• East Campus EC2, EC3 and South Campus bldg.. permit
	• 100% design documents (July 17th)
	• Continued Construction:
	  o Tower Crane erection (East Campus EC1)
	  o EC1, EC2 foundation excavations
	  o EC1 foundation concrete
	  o SC Moodie Drive road improvements
	  o SC excavations / civil works

Executive Status Report

Facility Renewal Program

Significant Risks / Challenges

- City of Ottawa Development charge risk (probability increased from SIOC report to Moderate)
- Unknown Site conditions (south campus)
- Managing HOL program change during design development;
- Technology and Operational change between design and 2019;
- HOL Change Management employee engagement (managing acceptance);
- Managing Design Build team cost and quality compliance;

Significant Opportunities

- Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated);
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 27% complete
- $25.6M is expended to date including land
- $4.3M (7%) of Design Build contract billed to date
- $1.9M (2.6%) forecasted against contingency –change reconciliation ongoing (risk)
- $4.8M in unallocated project contingency remains based on May 15th forecast.

Schedule Status

- The project is 20% complete and on schedule
- The 95% design review process completed
- East Campus EC1 bldg. permit was received June 14th – 3 weeks later than originally planned
- Remaining approvals forecast for completion by July 7th
- 100% design extended w/o impact to construction.

Budget Summary & Forecast May 24th, 2017:

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	95% Design Forecasted Revisions April 2017	Budget Forecast May 15th 2017	Spent to Date April 30th, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 516,200	$ 6,171,492	$ 1,970,534	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 1,389,678	$ 60,176,994	$ 4,274,719	7%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (1,905,878)	$ 4,780,714	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$25,576,253**	27%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Milestone Schedule & Status June 15th, 2017:

Activity	Milestone Date	Status
50% Design Submission to HOL	Nov. 17-016	100% complete
Site Plan Agreement Submission	Nov. 30 -16	100% complete
75% Design Submission EC1 to HOL	Jan. 19 -017	100% complete
Building Permit Submission to City (East Campus)	Jan. 23-017	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15-017	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23-17	100% complete
Building Permit Submission to City (South Campus)	Mar. 24-17	100% complete
Construction Mobilization - East Campus	Mar. 27-017	100% complete
Construction Mobilization - South Campus	Mar 27-017	100% complete
95% Design Submission to HOL	April 13-17	100% complete
Site Plan Agreement Approval - East Campus	May 3rd-2017	100% complete
Building Permit - East Campus	June 14-017	*100% complete*
Site Plan Approval - South Campus	June 26-017	*revised date - in progress*
Building Permit - South Campus	July 7th, 2017	*in progress*
100% Design Completion (all buildings)	July 17-017	*revised date - in progress*
East Campus Early Occupancy	Jan-019	
Substantial Completion of DB Contract	May 2-019	
Final Completion of DB Contract	June 26-019	
HOL Operational	July 2-019	

Site Photos: (to follow – technical issues)

Executive Status Report
Facility Renewal Program

Report #	**7**
Date of Report	**July 15th, 2017**
Report Period	**June 15th – July 15th, 2017**

Executive Summary

The project is on schedule and forecasted to be on budget.

Design & Construction

The design process is complete and the design-build team is working to finalize 100% IFC (Issued for Construction) drawings for the end of July. The Team is also finalizing costs associated with changes introduced during the design phase; the majority of pricing has been received and is under review by the Consultants and verTerra. Design related open items include blocking and stacking, building finishes and the EC1 lobby.

South Campus Site Plan Approval is expected by the end of July as all comments have now been addressed by the design-build team and documents resubmitted (MTO water management comments required redesign and resubmission). Construction activities included the mulching and removal of trees, stripping of the topsoil and construction of the access roads on the property.

Building Permit for EC2 and EC3 is also expected by the end of the July.

East Campus construction activities continue: the tower crane is now installed; excavation works continue; formwork for footings and mud slab is underway; dynamic compaction is complete for EC2 and EC3. The site trailer complex is established and the majority of the design-build and verTerra team members have completed Sullivan's site and safety orientation session. Contaminated soil has been identified, tested and stockpiled from excavations of EC2 and EC3. Soils will continue to be monitored with further excavations.

Construction Statistics

Construction is 8% complete based on billings ending June 30th. The overall project is 29% complete for the same period.

The overall budget forecast remains the same from last period and updates will be incorporated once design related change orders are finalized.

Organizational Change Management

As part of the Employee Engagement strategy, the OCM has scheduled a session with Supervisors and Managers on July 25th. Following this session, the plan is to finalize the furniture RFP and release to the market within the next reporting period. The OCM also released an employee survey related to fitness, and EC1 blocking and stacking plan will be developed and refined over the next reporting period.

The Team is incorporating information from last month's employee engagement sessions into the strategy and developing the OCM plan accordingly. Upcoming employee engagements will be planned for September due to summer holidays.

Operational Integration & Migration

The planning for this stream is underway and 'one-on-one' meetings are scheduled with IT and Operations/Warehousing. Hydro's IT team is well advanced in this area, and within the next reporting period the Team will be expanding the associated plan and schedule and integrating it with the construction schedule.

Executive Status Report
Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• East Campus tower crane erected.
• East Campus footings and slab formwork started.
• Design change costs submitted (under review).
• Real time video cameras installed – both sites.
	• South Campus Site Plan Approval
	• East Campus EC2, EC3 and South Campus building permit
	• 100% design documents (July 28th)
	• Design related changes review and approvals.
	• Continued Construction:
	  o EC1, EC2 foundation excavations
	  o EC1 foundation concrete and waterproofing
	  o SC Moodie Drive road improvements
	  o SC excavations / civil works

Significant Risks / Challenges	**Significant Opportunities**
• City of Ottawa Development charge risk (probability increased from SIOC report to Moderate) • Unknown Site conditions (south campus) • Managing HOL program change during design development; • Technology and Operational change between design and 2019; • HOL Change Management employee engagement (managing acceptance); • 100% Design cost reconciliation and sub-trade cost escalation • Managing Design Build team cost and quality compliance;	• Reintroduction of deferred VE programs, specifically the Training Centre to East Campus and Back-Up Control Centre to South Campus (after site approval and site condition risks mitigated); • Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 29% complete
- $27.5M is expended to date including land
- $5.3M (8%) of Design Build contract billed to date
- $1.9M (2.6%) forecasted against contingency –change reconciliation ongoing (risk)
- $4.8M in unallocated project contingency remains based on May 15th forecast.

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast

Update: July 15, 2017

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	95% Design Forecast update June 19th 017	Budget Forecast June 19th 2017	Spent to Date June 30, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 345,123	$ 6,000,415	$ 2,181,161	36%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 1,781,824	$ 60,569,140	$ 6,030,004	10%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (2,126,947)	$ 4,559,645	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 27,542,165**	29%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Executive Status Report
Facility Renewal Program

Schedule Status

- The project is on schedule
- 100% design drawings forecast for end of July.
- Remaining approvals forecast for completion by the end of July.

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast - SCHEDULE

Update: July 15, 2017

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	03-May-17	-	100% complete
Building Permit - East Campus	Jun. 14, 2017	-	*100% complete*
Site Plan Approval - South Campus	Jun. 26, 2017	Jul. 30, 2017	*revised date - in progress*
Building Permit - South Campus	Jul. 7, 2017	Jul. 30, 2017	*in progress*
100% Design Completion (all buildings)	Jul. 17, 2017	Jul. 30, 2017	*revised date - in progress*
East Campus Early Occupancy	Jan. 2019		
Substantial Completion of DB Contract	May 2, 2019		
Final Completion of DB Contract	Jun. 26, 2019		
HOL Operational	Jul. 2, 2019		

Site Photos: East Campus

Tower crane erection

EC2 Excavation

EC1 excavation and formwork

Site Photos: South Campus

Stripping of topsoil

Access Road and mulching

Ditching and stripping of topsoil

Mulching

Executive Status Report
Facility Renewal Program

Report #	**8**
Date of Report	**August 15th, 2017**
Report Period	**July 15th – August 15th, 2017**

Executive Summary

The project is on schedule and forecasted to be on budget.

Remaining contingency funds has been impacted with $1.9M of City of Ottawa development charges.

Design & Construction

The design process is complete and 100% IFC (Issued for Construction) drawings were issued August 4th. The Team has finalized the majority of design related change orders which have been provided to HOL for its approval. Open design related open items include blocking and stacking (planned to start September 18th), building finishes and the EC1 lobby.

South Campus Site Plan Approval is imminent. Final (favourable) comments and approvals were received from authorities, the team was awaiting final comments from the Rideau Valley Conservation Authority, which was received August 4th. MTO had identified a permit fee of approximately $25,000 for the South Campus, which was previously unknown.

Construction activities on the South Campus were focused to the main access road only and all site activities have come to a stop as of the end of July, awaiting final SPA approval. This does not yet impact the overall construction timeline for South Campus (Sullivan has identified being ahead of the original schedule at this point).

Building Permit for EC2 and EC3 is also imminent, it was expected at the end of the July.

East Campus construction activities continue: concrete formwork, rebar and concrete placement continues on EC1 (1000 cubic meters of concrete was poured in the month of July) as well as back filling at footing and foundations. Construction activities also continued for the main parking lot and bioswales. [redacted]

Construction Statistics

Construction is 12% complete based on billings ending July 31st. The overall project is 30% complete for the same period.

The overall budget forecast has been impacted with City of Ottawa development charges as well as forecasted costs for Enbridge service contribution cost requirements (not yet finalized).

Organizational Change Management

As part of the Employee Engagement strategy, the OCM committee held an information session with Supervisors and Managers on July 25th. At this session, the requirement for a focus group session with employee representatives from the Operations Centres was identified. A presentation has been developed and the session is scheduled for August 15th.

The plan remains to finalize the furniture RFP and release to the market within the next reporting period. The OCM committee closed an employee survey related to fitness (with preliminary summary of over 170 responses), and EC1 blocking and stacking plan has been scheduled for September 18th due to holidays.

The Team continues to incorporate information from last month's employee engagement sessions into the strategy and developing the OCM plan accordingly. Upcoming employee engagements will be planned for September due to summer holidays.

Operational Integration & Migration

Executive Status Report
Facility Renewal Program

The planning for this stream is underway and 'one-on-one' meetings were held with IT and Operations/Warehousing. Within the next reporting period verTerra will be presenting the expanded integration and migration plan to the Team for collective development (August 31st).

Major accomplishments since last report	Upcoming major activities (4 week look ahead)
• East Campus concrete formwork, rebar and concrete placement underway. • East Campus backfilling around footings and foundations started. • Parking lot and bioswale construction started. • Design change costs submitted for HOL review and approval. • SPA (informal) approvals received. Awaiting formal SPA. • 100% design documents issued.	• South Campus Site Plan Approval. • South Campus construction recommencing. • East Campus EC2, EC3 and South Campus building permit • Design related changes approved by HOL. • Continued Construction: o EC1, EC2 foundation excavations o EC1 foundation concrete and waterproofing o SC Moodie Drive road improvements o SC excavations / civil works
Significant Risks / Challenges	**Significant Opportunities**
• City of Ottawa Development charge risk – occurred. • Managing remaining contingency budget • Unknown Site conditions (south campus) • Managing HOL program change during design development; • Technology and Operational change between design and 2019; • HOL Change Management employee engagement (managing acceptance); • 100% Design cost reconciliation and sub-trade cost escalation • Managing Design Build team cost and quality compliance;	• Integrating Hydro Ottawa's history into the design and branding of the new facilities. • Disposal of Albion and Merivale properties

Budget Status

- 30% complete
- $28.8M is expended to date including land
- $7.1M (12%) of Design Build contract billed to date
- $4.04M forecasted against contingency (design change + 1.9M for development charges). The City's DC reversal several impacts the contingency management strategy and leaves $2.6M (3.6%) on the remaining program budget (calculated on total approved capital less land and contingency).

Hydro Ottawa Limited: Q2 2017 Facility Renewal Program Capital Budget Forecast

Update: August 15th, 2017

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	95% Design Forecast update June 19th 017	Budget Forecast June 19th 2017	Spent to Date May 31rst, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 2,259,093	$ 7,914,385	$ 2,335,161	30%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 1,781,824	$ 60,569,140	$ 7,119,638	12%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 4,025,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (4,040,917)	$ 2,645,675	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 28,785,799**	30%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Executive Status Report
Facility Renewal Program

Schedule Status

- The project is on schedule
- Remaining approvals by authorities are imminent.

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast - SCHEDULE			
Update: August 15th, 2017			
Milestone Schedule & Status			
Activity	**Milestone Date**	**Forecast Date**	**Status**
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	03-May-17	-	100% complete
Building Permit - East Campus	Jun. 14, 2017	-	*100% complete*
Site Plan Approval - South Campus	Jun. 26, 2017	Jul. 30, 2017	*revised date - in progress*
Building Permit - South Campus	Jul. 7, 2017	Jul. 30, 2017	*in progress*
100% Design Completion (all buildings)	Aug. 4, 2017	Jul. 30, 2017	*100% complete*
East Campus Early Occupancy	Jan. 2019		
Substantial Completion of DB Contract	May 2, 2019		
Final Completion of DB Contract	Jun. 26, 2019		
HOL Operational	Jul. 2, 2019		

Site Photos: East Campus

EC1 raft footing at East end of building

E C1 raft footing at centre of building and backfill

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Executive Status Report
Facility Renewal Program

EC1 foundation wall concrete placement and backfilling

EC bioswale installation (main parking lot)

Site Photos: South Campus

SC – construction of main access road

Executive Status Report

Facility Renewal Program

Report #	**9**
Date of Report	**September 15th, 2017**
Report Period	**August 15th – September 15th, 2017**

Executive Summary

The project is on schedule and forecasted to be on budget. However, HOL's project contingency was significantly impacted by the $1.9M Development Charge reversal by the City of Ottawa [redacted]

The potential purchase interest in Albion Rd., (a positive development) would require HOL to exit fully by June 2019, a month earlier than originally planned. The early partial occupancy of EC1 remains scheduled for January 2019 to permit leaving 15months to commence operational fit-up of the new facilities. The execution of HOL's Operational migration and Change Management activities are the key focus as construction operations are stabilized and ramping up efficiently.

Design and Construction:

The main design phase is completed with approved HOL program changes incorporated. Open design issues include finish color selections, Stacking and Blocking (where the departments will be located), the Fitness area, Multi-Faith, Lobby displays, Art, wayfinding signage and room naming conventions. These areas are dependent on Change Management and Employee engagement activities and are all in progress.

All construction permits for the East Campus are in place and Site Plan Approval for the South Campus was approved by the City two weeks ago, a Delegated Authority report is being prepared, which will enable release of the building permits.

Construction on the East Campus has advanced efficiently [redacted]. EC1 structural concrete is now completed to the 1rst level, EC3 foundations are complete, and EC2 foundation excavations are well underway. The South Campus construction has been on hold pending approvals, but remains ahead of schedule (work was to commence next year) and foundations may advance prior to winter if permits can be secured. A protected Butternut Tree must be removed to allow for the Solar installation and approvals are in progress with the Ministry of Natural Resources.

Construction Key Stats:

- 32% complete based on billings ending August 31rst, 2017
- 27% complete based on schedule.
- No Lost time accidents over 115 days
- Average manpower on site 55.
- 1812m3 of concrete poured (EC1 and EC3)

Operational Integration Migration & Change Management:

The detailed planning for the Operational Migration and Change Management is ongoing with departmental planning sessions continuing. The target is to have a comprehensive HOL migration plan (strawman) and schedule, identifying all HOL requirements, the migration sequencing and integration points with Change Management and Construction by mid-Oct 017. This plan will account for the current property disposition opportunities.

This area of the program is now the primary focus of the Project team.

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- South Campus Site Plan review approval
- Design phase completed
- Contaminated soils mitigation plan implemented
- Sullivan sub-trade tenders released:
  - . drywall, flooring, painting, doors and hardware, garage doors
- EC1 structure reaches level 1, above grade
- EC3 foundations completed
- EC2 foundations commenced
- East Campus parking lot and service excavations/grading
- Category 3 Butternut removal agreement structure developed with MNR/RVCF
- Moodie Drive road improvements (SC)

Upcoming major activities (4 week look ahead)

- South Campus building permit (or foundation permit)
- Continued Construction:
  - EC1 level 2 floor structure (backfill and waterproofing)
  - EC2 foundations
  - EC3 backfill, waterproofing
  - SC excavations / civil works
- Furniture RFP draft to HOL Supply
- Staking and Blocking Session
- Finishing Color review session

Significant Risks / Challenges

- Unknown Site conditions (South campus)
- HOL program change and integration (operational migration/change management streams) with construction
- Technology and Operational change between design and 2019;
- Cost reconciliation and sub-trade cost escalation
- Managing Design Build team cost and quality compliance

Significant Opportunities

- Disposal of HOL's Albion and Merivale properties
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 32% complete based on billings ending August 31rst
- $30.4M expended to date including land
- $8.7M expended to date on design build (14%)
- $4.66M forecast against contingency
- $2.02M remaining contingency

Hydro Ottawa Limited: Q2 2017 Facility Renewal Program Capital Budget Forecast

Update: September 15th , 2017

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	100% Design Forecast update Aug. 23 2017	Forecasted Revisions Sept 15th, 2017	Budget Forecast Sept 15th, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 2,445,221	$ 7,914,385	$ 2,418,131	31%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 2,408,925	$ 61,196,241	$ 8,724,001	14%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (325,000)	$ 3,700,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (4,664,146)	$ 2,022,446	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,178,872**	**$ 30,473,132**	32%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is 27% complete and on schedule

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast - SCHEDULE

Update: August 29th, 2017

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	*100% complete*
Site Plan Approval - South Campus	Jun. 26, 2017	***Sept. 15-017***	***approval by City staff in place***
Building Permit - South Campus	Jul. 7, 2017	***Sept 30-017***	***revised date - delayed***
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17		21% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		
EC Solar Array	Jan. 10-19		
EC2 Pre-Eng Garage Structure	Nov.2-017		
EC2 Enclosed (Watertight)	Aug. 8-017		
EC3 Pre-Eng Bldg. Structure	Nov. 13-017		
EC3 Enclosed (Watertight)	Dec. 11-017		
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018		
SC Structure Enclosed (Watertight)	Oct. 24-018		
SC Solar Array	Jan. 15-019		
East Campus Early Occupancy	Jan. 2019	UNDER REVIEW WITH DISPOSITON	
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019		
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	UNDER REVIEW WITH DISPOSITON	
Final Completion of DB Contract	Jun. 26, 2019		
HOL Operational	Jul. 2, 2019		

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Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1 Pouring concrete for last segment of Level 1 (Sept. 15-017)

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Executive Status Report

Facility Renewal Program

EC1 Concrete Shoring (level 1)

Executive Status Report

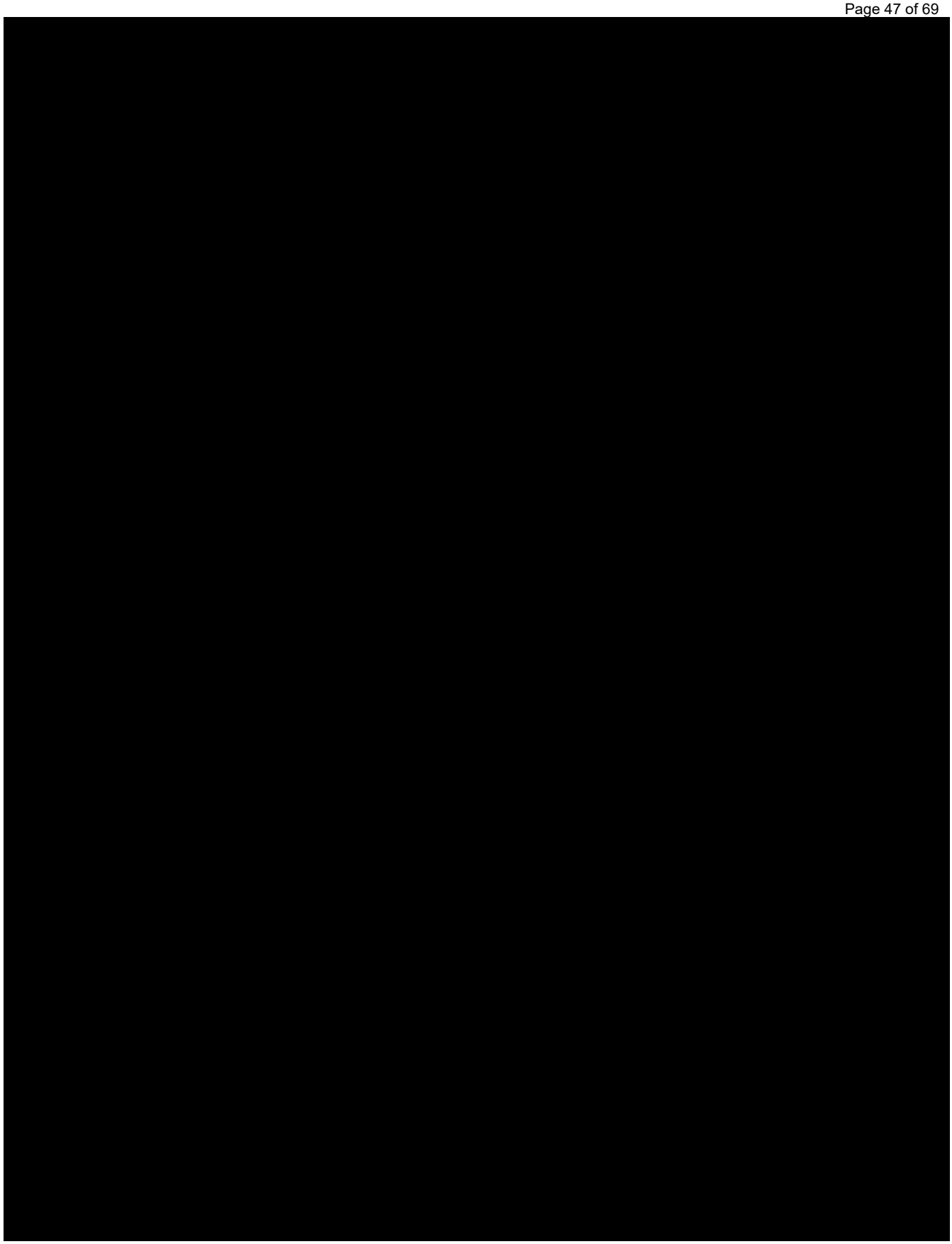
Facility Renewal Program

EC3 Foundations:

Executive Status Report

Facility Renewal Program

EC2 Foundation Excavation



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Executive Status Report

Facility Renewal Program

Site Photos: South Campus

Site Cleared awaiting permits.

Executive Status Report

Facility Renewal Program

Executive Status Report

Facility Renewal Program

Report #	**10**
Date of Report	**October 15th, 2017**
Report Period	**September 15th to October 15th, 2017**

Executive Summary

The project is ahead schedule and forecasted to be on budget.

[redacted] A certification letter, stamped by the Geotechnical Engineer of record, assuring compliance to the Ministry of Environment regulations is on record. Final costs are forecast within the revised budget.

An offer for the purchase of Albion Rd., was received and countered by HOL. The HOL migration planning advanced based on an earlier completion of the FRP construction (May 1-2019), which was reviewed by Sullivan. The detailed migration plan will be finalized by December but a 3 Phase strategy confirmed:

Phase 1: IT/ Security Infrastructure & Facility Operations – January to March 2019

Phase 2: System Control Office & Warehouse – February to April 2019

Phase 3: Fleet Operations and People Migration – April to May 1rst, 2019

Detailed operational integration meetings have occurred validating the above, which will now be combined with the Change Management activities to finalize the migration plan. The Furniture RFP release was extended to better define the technical requirements and pricing. The intent is to have this procurement awarded by January 2018. A furniture budget forecast validation was completed by verTerra and the original budget confirmed.

Design and Construction:

Departmental Stacking and Blocking (spatial testing of the floor plates) was completed and HOL departmental consolidation achieved ie: all major departments in one area with appropriate adjacencies. Some architectural changes resulted which are being assessed with design reduction offsets. The final finishing materials and colour palette was completed within the original budget. Open areas of the design include the Fitness area, Multi-Faith, Lobby displays, Art, wayfinding signage and room naming conventions. These areas are dependent on Change Management and Employee engagement activities and are all in progress.

Construction on the East Campus, and EC1 specifically, is proceeding ahead of schedule. The concrete structure is at level 2, with walls for level 3 poured. Slab on grade for EC1 is scheduled for November and exterior steel studs will commence thereafter. The delivery of the Pre-Engineered EC2 and EC3 structures were delayed by a month but will both be erected prior to Christmas this year. Site Plan Approval for the South Campus has been signed off by the Ward Councillor but the final agreement, necessary for building permit, not yet finalized by the City. Foundation operations on the South Campus are scheduled to commence November 6th.

Construction Key Stats:

- 18% complete based on billings ending September 30th, 2017
- No Lost time accidents over 216 days
- Average manpower on site 60.
- 3967m3 of concrete poured to date (east campus)

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- South Campus Site Plan Delegated Authority Report executed by Ward Councillor
- Contaminated soils mitigation plan successful
- Sullivan sub-trade tendering 85% complete
- EC1 level 2 structure
- EC3 foundations completed
- EC2 foundations 90% complete
- East Campus parking lot and service excavations/grading
- Category 3 Butternut removal agreement finalized for SC Solar
- Solar Design Brief complete
- Stacking and Blocking complete
- Finishing colours complete
- Albion Rd Offer received and counter offer issued
- Migration strategy developed

Upcoming major activities (4 week look ahead)

- South Campus SPA and building permit finalized
- Continued Construction:
  - EC1 level 3 floor structure)
  - EC2 foundations
  - SC excavations / foundations
- Finishing tenders (by Sullivan)
- Furniture RFP
- Migration planning and schedule
- Change Management and Operational Integration strategy session
- Solar design approval by HOL

Significant Risks / Challenges

- Unknown Site conditions (South campus)
- HOL program change and integration (operational migration/change management streams) with construction
- Technology and Operational change between design and 2019;
- Cost reconciliation and sub-trade cost escalation
- Managing Design Build team cost and quality compliance

Significant Opportunities

- Disposal of HOL's Albion and Merivale properties
- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 34% complete based on billings ending September 2017
- $32.6M expended to date including land
- $10.7M expended to date on design build (18%)
- $4.66M forecast against contingency
- $2.02M remaining contingency

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast

Update: October 15th , 2017

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	100% Design Forecast update Aug. 23 2017	Forecasted Revisions Oct 15th, 2017	Budget Forecast Oct 15th, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 2,431,251	$ 7,900,415	$ 2,485,361	31%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 2,408,925	$ 61,196,241	$ 10,741,799	18%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (325,000)	$ 3,700,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (4,664,146)	$ 2,022,446	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,164,902**	**$ 32,558,160**	34%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan is ongoing.

Hydro Ottawa Limited: Q3 2017 Facility Renewal Program Capital Budget Forecast - SCHEDULE

Update: October 15th , 2017

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	*100% complete*
Site Plan Approval - South Campus	Jun. 26, 2017	***Nov-1-017***	***Delegated Authority Report***
Building Permit - South Campus	Jul. 7, 2017	***Nov-6-017***	***revised date - delayed***
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17		21% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		
EC Solar Array	Jan. 10-19	***Dec-018***	
EC2 Pre-Eng Garage Structure	Nov.2-017	***Dec-15-017***	*Delayed Delivery*
EC2 Enclosed (Watertight)	Aug. 8-018		
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	***Dec-15-017***	*Delayed Delivery*
EC3 Enclosed (Watertight)	Dec. 11-017	***Dec-15-017***	
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018		
SC Structure Enclosed (Watertight)	Oct. 24-018		
SC Solar Array	Jan. 15-019	***Dec-018***	
East Campus Early Occupancy	Jan. 2019	UNDER REVIEW WITH DISPOSITON/MIGRATION	
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	UNDER REVIEW WITH DISPOSITON/MIGRATION	
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	UNDER REVIEW WITH DISPOSITON/MIGRATION	
Final Completion of DB Contract	Jun. 26, 2019	UNDER REVIEW WITH DISPOSITON/MIGRATION	
HOL Operational	Jul. 2, 2019	UNDER REVIEW WITH DISPOSITON/MIGRATION	

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1 Formwork to Level 2

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Executive Status Report

Facility Renewal Program

EC1 Level 1 Slab

EC1 Exposed Retaining Wall (east end)

HydroOttawa

Executive Status Report

Facility Renewal Program

HydroOttawa

Executive Status Report

Facility Renewal Program

EC2 Foundations (overview)

EC3 Foundations Complete

HydroOttawa

Executive Status Report

Facility Renewal Program

Site Photos: South Campus (no updated activity)

Executive Status Report

Facility Renewal Program

Report #	**11**
Date of Report	**November 15th, 2017**
Report Period	**October 15th to November 15th, 2017**

Executive Summary

The Project Team is working extremely well together over all fronts and the focus has shifted to HOL migration integration and planning – 2018 will be a busy year. The project is ahead schedule and forecasted to be on budget. The project construction completion is now confirmed for March 18th, 2019, 2.5 months ahead of the original contract date.

Design and Construction:

Divisional Stacking and Blocking is complete and the team will can now commence the strategy for desk/team level planning and the Furniture Supplier procurement in January 2018. Design options for the Fitness area, Multi-Faith, Lobby displays, Art, wayfinding signage are in development and will be presented to HOL in December. Detailed planning for the System Office was commenced this period and Room Naming conventions and wayfinding signage will commence in December.

The East Campus EC1 concrete structure (level 3) will be complete, or "topped off" December 1rst, 2019 and EC2 and EC3 structural steel will commence November 26th. The South Campus Site Plan Agreement and Building permit have been received. Construction on the South Campus foundations are underway, with the plan to complete the foundations by Christmas this year – but may be pushed to spring 2018 if harsh weather prevents completion.

Construction Key Stats:

- 21% complete based on billings ending October 31rst, 2017
- No Lost time accidents over 255 days
- Average manpower on site 60.
- 5134m3 of concrete poured to date (east campus)

Detailed operational migration and change management planning continues and a comprehensive schedule and requirements will be prepared for December based on the 3 Phase Migration Strategy below:

Phase 1: IT/ Security Infrastructure & Facility Operations – January to March 2019

Phase 2: System Control Office & Warehouse – February to April 2019

Phase 3: Fleet Operations and People Migration – April to May 1rst, 2019

A combined operational migration and change management meeting is scheduled for November 28th, with a key focus on assessing HOL policy framework in the new facilities and developing new, or revising existing HOL policies as required. The Furniture RFP is planned for release in December with HOL evaluations and award by end of January 2018.

The Albion property offer to purchase is moving to finalization with the Buyer's latest counter offer. The closing is June 2019. [redacted] confirmed they will not purchase Merivale, and the property will be released to the market with an extended closing date of Fall 2019.

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- EC1 level 3 structure
- EC2 foundations complete
- SC Site Plan Agreement received
- SC Building Permit received
- South Campus foundations commenced
- Albion Rd Offer to Purchase near completion
- System Control office and ICC technology design commenced
- EC Private Drainage Agreement legal terms completed

Upcoming major activities (4 week look ahead)

- Continued Construction:
  - EC1 level 4 floor structure
  - EC2 and EC3 Pre-engineered building erection
  - EC sanitary pumping station
  - EC Gas Service
  - SC excavations / foundations
  - SC Project Sign
- Continuing Interior Finishing tenders (by Sullivan)
- Furniture RFP
- Migration planning and schedule
- Change Management and Operational Integration strategy session
- Solar design approval by HOL
- Marketing of Merivale property

Significant Risks / Challenges

- Unknown Site conditions (South campus)
- HOL program change and integration (operational migration/change management streams) with construction
- Technology and Operational change between design and 2019;
- Cost reconciliation and sub-trade cost escalation
- Managing Design Build team cost and quality compliance

Significant Opportunities

- Integrating Hydro Ottawa's history into the design and branding of the new facilities.

Budget Status

- 36% complete based on billings ending October 31rst, 2017
- $34.6M expended to date including land
- $12.7M expended to date on design build (21%)
- $4.9M forecast against contingency
- $1.8M remaining contingency

Update: Nov. 6th, 2017

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	100% Design Forecast update Aug. 23 2017	Forecasted Revisions Nov. 6th, 2017	Spent to Date Oct 31rst, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,101,234	$ 5,655,292	$ 2,431,251	$ 7,900,415	$ 2,565,286	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,064,048	$ 61,851,364	$ 12,680,666	21%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ -	0%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (325,000)	$ 3,700,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (4,888,141)	$ 1,798,451	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,596,030**	**$ 34,576,952**	36%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Update: Nov. 15th, 2017

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	*Nov-15-017*	100% complete
Building Permit - South Campus	Jul. 7, 2017	*Nov-15-017*	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17		21% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		
EC Solar Array	Jan. 10-19	***Dec 1-018***	*Confirmed by MSSL*
EC2 Pre-Eng Garage Structure	Nov.2-017	Dec-15-017	*Delayed Delivery*
EC2 Enclosed (Watertight)	Aug. 8-018		*Under review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Nov-26-017	*Delayed Delivery*
EC3 Enclosed (Watertight)	Dec. 11-017		*Under review*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	***Mar-18***	*Under review*
SC Structure Enclosed (Watertight)	Oct. 24-018	***Aug. 9-018***	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	***Dec-018***	
East Campus Early Occupancy	Jan. 2019	***Jan. 2, 2019***	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	***January to April 30th 2019***	*Confirmed by MSSL*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	***March 18th, 2019***	*Confirmed by MSSL*
Final Completion of DB Contract	Jun. 26, 2019	***May 13, 2019***	*Confirmed by MSSL*
HOL Operational	Jul. 2, 2019	***May 15th, 2019***	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1 Formwork to Level 4

Executive Status Report

Facility Renewal Program

EC2 Foundations Complete

HydroOttawa

Executive Status Report

Facility Renewal Program

SC Foundations commenced

Executive Status Report

Facility Renewal Program

Report #	**12**
Date of Report	**December 15th, 2017**
Report Period	**November 15th to December 15th, 2017**

Executive Summary

The project is ahead schedule and forecasted to be on budget. The project construction completion is now confirmed for March 18th, 2019, 2.5 months ahead of the original contract date.

Interior design for the open areas ie: main Lobby displays, Fitness area, Multi-Faith room and wayfinding and signage continue to be advanced with a preliminary HOL review package to be submitted by the end of December. Furniture procurement is now scheduled for January 018. HOL Desk level assignment planning will commence once the furniture supplier is on board, in combination with furniture development. The System office technology design and equipment selection remains in progress and bi-weekly IT/Technology migration meetings have been established to ensure complete integration with the construction. Warehouse migration planning also advanced and will continue with the IT/Technology, Operations and Metering groups. A Policy strategy working session meeting occurred this period which launched this critical stream of the project which will continue development over the duration of the FRP project.

Sullivan was directed to restructure their Solar design and management team on Solar program to better address both Energy Ottawa's and verTerra's expectations and requirements, which were not being achieved. Sullivan acknowledged the need and are preparing a plan to resolve.

The East Campus EC1 concrete structure was completed ("topped off") December 7th. Both the EC2 and EC3 structural steel was been delivered and the EC3 frame erected this period – weather has delayed the erection of EC2 this week. Temporary hoarding and the permanent exterior wall framing has commenced to enclose and heat EC1 for winter for interior works. South Campus foundations progress this period but remain weather dependent and work may stop for the winter and recommence in early spring.

Key Construction Stats:

- 24% complete based on billings ending November 30th, 2017
- No Lost time accidents over 281 days
- Average manpower on site + 60
- +6300m3 of concrete poured to date (both campuses)

The Albion property was conditionally sold November 20th, 2017 [redacted] and a FRP disposition team has been set-up to manage the Merivale Rd., sale. Merivale Rd., will be marketed by HOL in the New Year and there is already expressed interest from several entities. The closing date planned for Merivale is the Fall of 2019 to permit contingency time to ensure the migration [redacted] and the completion the back-up control room at Bank St.

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- EC1 concrete completed
- EC1 envelope framing and enclosures commenced
- EC2 and EC3 Pre-engineered steel delivered
- EC3 steel frame erected
- EC gas service completed by Enbridge
- Independent Envelope Testing Consultant in place
- SC construction fully mobilized
- HOL Policy development commenced
- HOL Signage and wayfinding strategy development commenced
- EC1 Open design areas advanced
- Disposition team for both Albion and Merivale structured

Upcoming major activities (4 week look ahead)

- Continued Construction:
  - EC1 structural steel
  - EC1 Level 0 Slab-on-Grade
  - EC2 Pre-engineered building erection
  - SC foundations (weather dependent)
  - SC Project Sign
- Completion of remaining sub-tenders (by Sullivan)
- Furniture RFP (by verTerra/HOL)
- Solar design team restructuring by Sullivan

Significant Risks / Challenges

- Unknown Site conditions (South campus)
- HOL program change and integration (operational migration/change management streams) with construction
- Technology and Operational change between design and 2019;
- Cost reconciliation and sub-trade cost escalation
- Managing Design Build team cost and quality compliance

Significant Opportunities

- Disposal of HOL's Merivale property
- Integrating Hydro Ottawa's history into the design and branding of the new facilities
- Capital cost saving potential for "HOL Record" digitization ie: deletion of record storage vault, reduction in print copy requirements
- Revised HOL Policy and work processes efficiency gains

Budget Status

- 48% complete based on billings ending Nov. 30th, 2017
- $37.9M expended to date including land
- $14.9M expended to date on design build (24%)
- $4.87M forecast against contingency
- $1.81M remaining contingency

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Dec 15th, 2017	Revised Forecast Dec. 15th, 2017	Spent to Date Nov. 30th, 2017	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 3,251,234	$ 5,805,292	$ 2,000,123	$ 7,805,415	$ 3,721,878	48%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 2,876,151	$ 61,663,467	$ 14,903,995	24%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ -	$ 3,875,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (4,876,274)	$ 1,810,318	$ -	0%
	Totals	**$ 95,818,483**	$ 831,517	**$ 96,650,000**		**$ 96,500,000**	**$ 37,974,855**	39%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Update: Dec. 15th, 2017

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	*Nov-15-017*	100% complete
Building Permit - South Campus	Jul. 7, 2017	*Nov-15-017*	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		
EC Solar Array	Jan. 10-19	***Dec 1-018***	*Confirmed by MSSL*
EC2 Pre-Eng Garage Structure	Nov.2-017	Dec-15-017	*Delayed Delivery*
EC2 Enclosed (Watertight)	Aug. 8-018		*Under review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017		*Under review*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	***Mar-18***	*Under review*
SC Structure Enclosed (Watertight)	Oct. 24-018	***Aug. 9-018***	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	***Dec-018***	
East Campus Early Occupancy	Jan. 2019	***Jan. 2, 2019***	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	***January to April 30th 2019***	*Confirmed by MSSL*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	***March 18th, 2019***	*Confirmed by MSSL*
Final Completion of DB Contract	Jun. 26, 2019	***May 13, 2019***	*Confirmed by MSSL*
HOL Operational	Jul. 2, 2019	***May 15th, 2019***	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1 Structure Complete

Executive Status Report

Facility Renewal Program

EC1 – Level 0 Underground Electrical

Executive Status Report

Facility Renewal Program

EC Gas Main (by Enbridge):

EC2 Foundations (too cold/windy to erect steel)

EC3 Structure Being Erected:

SC Foundations (hoarded for winter):

HydroOttawa

Executive Status Report

Facility Renewal Program

Report #	**13**
Date of Report	**February 15th, 2018**
Report Period	**December 15th, 2017 – February 15th, 2018**

Executive Summary

The project is ahead schedule and forecasted to be on budget. The project construction completion is scheduled for March 18th, 2019, 2.5 months ahead of the original contract date.

This period advanced the completion of the open design areas within EC1 which were influenced by HOL staff engagement sessions and the Operational Change Committee, specifically the Lobby and the development of an HOL cultural feature, the multi-faith room, fitness and cafeteria revisions and various changes to HOL closed office areas required by revised HOL departmental staffing requirements. This was a positive achievement and sets the basis for the final EC1 interiors, with minor areas specific to HOL operations and the Lobby Design feature requiring further development. The system control office technical design was also completed [redacted]

Sullivan, as directed, proposed a new Solar team incorporating a highly experienced Solar provider and have provided a more fulsome management structure. A technical and commercial review with Energy Ottawa is scheduled for next week to align the team prior to full implementation. The Solar work is scheduled to be complete by December to integrate with building system commissioning.

HOL Operational migration planning continues and is the central focus of the verTerra team. HOL's policy, workplace procedure/process strategy is under development with the critical objective to ensure HOL's existing policies are revised, and new policies/work processes developed, to maintain operational compliance and support, if not drive, the goals and objectives of HOL's change management strategy and a new sustainable workplace. HOL conducted Signage and Wayfinding focus sessions which will inform the Signage/Wayfinding design tem being led by HOK. Detailed fitness (gym) equipment Design and Programing will commence next period.

The furniture RFP was released February 13th and closes March 20th. An HOL evaluation team has been established comprised of varying department staff members who were also members of Change Management Furniture review team. The basis of the procurement evaluation is both qualitative and quantitative as the contract scope includes the FRP project and ongoing furniture management services. Once a successful proponent is selected, detailed departmental furniture, team seat planning and mock-ups will commence.

The East Campus EC1 construction continues to advance with the 4th floor steel and atrium structure erected, exterior walls, windows and curtainwall and interior partitions commenced, as well as mechanical and electrical distributions. The EC2 pre-engineered garage steel was erected and civil work on the storm water, sanitary advanced. The City of Ottawa has not released the Commence Work Order for the project, due to a City change in the Site Plan Agreement securities, which could impact the commencement of underground services – this is being resolved with HOL and the City. HOL operations commenced the circuit upgrade work along Hunt Club Rd., for the East Campus main power. Sullivan has now tendered predominantly all construction subcontracts, excluding only asphalt pavements, including the Hunt Club Road intersection work, millwork and some minor accessories.

Construction on the South Campus was been shut down in December with the extreme cold weather and will recommence in March.

Overall construction and the project is proceeding extremely well.

HydroOttawa

Executive Status Report

Facility Renewal Program

Key Construction Stats:

- 29% complete based on billings ending January 31rst, 2017
- No Lost time accidents over 328 days * *(on January 18th a steel worker was taken to the hospital after being hit in the leg with a steel beam while unloading from a forklift. The Ministry of Labour investigated and no orders issued and the worker returned to site that day – no lost time.)*
- Average manpower on site +50
- +6631m3 of concrete poured to date

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• EC1 Interior design closed on open areas
• Furniture tender released
• HOL Focus Sessions conducted on Multi-Faith and Wayfinding and Signage
• HOL Policy development strategy ongoing
• Solar team restructured and proposal developed
• Merivale Rd., property conditionally sold
• Albion Rd., severance application to City
• EC1 slabs on grade, interior partitions and mechanical/electrical distributions
• EC1 exterior wall, windows and curtainwall framing
• EC1 Roof and Atrium steel and deck erected
• EC1 cooling tower delivery
• EC1 Structural Tower Crane removed
• EC2 pre-engineered frame erected
	• Continued Construction:
	  ○ EC1 roof steel decking
	  ○ EC1 exterior wall / enclosures
	  ○ Interior partitioning / M&E distributions
	  ○ EC civil work
	  ○ EC2 block work for single story office area (weather dependent).
	• Completion of remaining sub-tenders (by Sullivan) – roadwork and millwork.
	• Commissioning plan start up
	• Solar design and program review / kick-off
	• Release of the Commence Work Order by the City
	• Furniture tender procurement management
	• Final Wayfinding and Signage focus session
	• HOL Migration and Policy planning, (continued development)

Significant Risks / Challenges	**Significant Opportunities**
• Unknown Site conditions (South campus); • HOL program change and integration (operational migration/change management streams) with construction; • HOL policy development (internal timeline risk); • Managing Design Build team cost and quality compliance.	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains.

HydroOttawa

Executive Status Report

Facility Renewal Program

Budget Status

- 42% complete based on billings ending January 31rst, 2018
- $41M expended to date including land
- $17.8M expended to date on design build (29%)
- $5.09M forecast against contingency
- $1.59M remaining contingency.

Budget Summary & Forecast

ID	Category	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Feb. 15th, 2018	Current Forecast Feb. 15th, 2018	Invoiced To Date Jan. 31st 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ -	$ 3,726,684	$ 2,506,184	67%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,225,123	$ 4,153,731	$ 1,342,524	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,017,119	$ 61,804,435	$ 17,810,254	29%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (150,000)	$ 3,875,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,092,242)	$ 1,594,350	$ -	0%
	Totals	$ 95,818,483	$ 681,517	$ 96,500,000		$ 96,500,000	$ 41,007,945	42%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Budget less land/contingency $ 75,574,650
Remaining Contingency % 2.11%

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Update: Feb 15th, 2018
Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	*Nov-15-017*	100% complete
Building Permit - South Campus	Jul. 7, 2017	*Nov-15-017*	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 1-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd Improvements	Sept 7-18		
EC Solar Array	Jan. 10-19	*Dec 1-018*	*Confirmed by MSSL*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018		*Under review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017		*Under review*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	*Mar-18*	*Under review*
SC Structure Enclosed (Watertight)	Oct. 24-018	*Aug. 9-018*	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	*Dec-018*	
East Campus Early Occupancy	Jan. 2019	*Jan. 2, 2019*	*Confirmed by MSSL*
HOL Fit-Up (Control Rm ,IT) & Migration	Jan-June-019	*January to April 30th 2019*	*Confirmed by MSSL*
Substantial Completion of DB Conract (EC & EC)	May 2, 2019	*March 18th, 2019*	*Confirmed by MSSL*
Final Completion of DB Contract	Jun. 26, 2019	*May 31, 2019*	*Confirmed by MSSL*
HOL Operational	Jul. 1, 2019	*May 13th, 2019*	*Planned Date*

Site Photos: East Campus

EC1 Roof & Atrium Steel, Curtainwall (February 018)

HydroOttawa

Executive Status Report

Facility Renewal Program

EC1 Exterior Wall and Window Framing & Sheathing (January 018)

HydroOttawa

Executive Status Report

Facility Renewal Program

EC1 – Removal of Concrete Tower Crane (December 017)

HydroOttawa

Executive Status Report

Facility Renewal Program

EC1 Mechanical Rough-Ins LO (January 018)

EC1 Interior Wall Framing L0 (January 018)

HydroOttawa

Executive Status Report

Facility Renewal Program

EC2 Pre-engineered Garage Steel erected

EC2 Structure Side Profile

HydroOttawa

Executive Status Report

Facility Renewal Program

Executive Status Report

Facility Renewal Program

Report #	**14**
Date of Report	**March 15th, 2018**
Report Period	**February 15th to March 15th, 2018**

Executive Summary

The project is ahead schedule and forecasted to be on budget. The substantial completion of the project is scheduled for March 18th, 2019, and Sullivan has confirmed the early occupancy by HOL of EC1 by January 1, 2019 to commence HOL fit-up.

Open design areas in the buildings are now limited to the main EC1 Lobby, EC1/SC fitness areas, signage and wayfinding. The Solar team is now meeting bi-weekly and will close on the design and system equipment selections which will define the budget and schedule. The solar work will require various regulatory approvals, including building permit amendments but the team is confident all permits can be secured without impacting the December completion target.

HOL Operational and Change Management planning continues on all fronts and verTerra has added a dedicated manager to work the HOL's Change and Migration Management committees. The furniture tender closes March 20th, with vendor presentations on March 26th and 27th. Award is scheduled to be by April 5th, 2018. Upon award HOL will need to commence with detailed divisional seat planning to ensure the furniture design is completed within schedule to permit manufacturing.

Construction activities have been concentrated on EC1, with exterior walls, curtainwall and windows scheduled to be watertight by March 28th. Interior wall framing is on occurring on all levels, as is mechanical/electrical distributions. Major mechanical air handling equipment will be delivered this month. East Campus civil work has advanced with both storm water and sanitary installations. On EC2 ground thaw units have been placed to advance the office area slab concrete and masonry walls required for the office area steel erection. The South Campus pre-engineered building steel was delivered to site, but work on the south campus foundations will not commence until April now due to the recent weather.

HOL resolved the Commence Work Order with the City, closing all permits for the East Campus. The South Campus full building permit is being processed by the City, as is the last butternut tree removal permit required for the solar work.

Key Construction Stats:

- 32% complete based on billings ending February 28th, 2018
- No Lost time accidents over 356 days
- Average manpower on site +58
- +6740m3 of concrete poured to date

The property disposition team is concentrated on satisfying the due diligence conditions for both Albion and Merivale.

[redacted]

Executive Status Report

Facility Renewal Program

Major accomplishments since last report

- Continued Construction:
  - EC1 roof steel decking
  - EC1 exterior wall / enclosures
  - Interior partitioning / M&E distributions
  - EC civil work
  - SC pre-engineered steel delivery
- Release of the Commence Work Order by the City
- Final Wayfinding and Signage focus session and 1rst design review
- Commissioning draft plan issued
- Operational Change Management and Migration planning advanced
- Solar design and program development advanced
- EC1 Control Centre scope approved

Upcoming major activities (4 week look ahead)

- EC1 exterior enclosure, interior wall framing, mechanical and electrical systems
- EC2 ground thaw and concrete/ block work for single story office area;
- EC3 ground thaw to advance masonry;
- Completion of remaining sub-tenders (by Sullivan) – roadwork and millwork.
- Solar design, budget and schedule finalization (for approval)
- Furniture tender close and award
- HOL Migration and Policy planning, (continued development)
- Signage and wayfinding design package (first draft for HOL).

Significant Risks / Challenges

- Unknown Site conditions (South campus);
- Unapproved cost changes under review (not in forecast) and contingency management to completion;
- The South Campus fire protection water holding system may need to increase in capacity anticipated by their design by 3 to 5x due to the height of the warehouse racking systems. This is being assessed by professionals from both Sullivan and verTerra;
- HOL program change and integration (operational migration/change management streams) with construction;
- HOL policy development (internal timeline risk);
- Managing Design Build team cost and quality compliance.

Significant Opportunities

- Integrating Hydro Ottawa's history into the design and branding of the new facilities;
- Revised HOL Policy and work processes efficiency gains.

Budget Status

- 44% complete based on billings ending February 28th, 2018
- $42.8M expended to date including land
- $19.6M on the design build program (32%)
- $5.09M forecast against contingency
- $1.58M contingency remaining

Budget Summary & Forecast

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Mar. 15th, 2018	Current Forecast Mar. 15th, 2018	Invoiced To Date Feb. 28th 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (13,970)	$ 3,712,714	$ 2,577,536	69%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,256,593	$ 4,185,201	$ 1,377,011	33%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,007,119	$ 61,794,435	$ 19,593,332	32%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ -	$ 2,014,800	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (150,000)	$ 3,875,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,099,742)	$ 1,586,850	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 42,896,861**	44%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		
				Budget less land/contingency		$ 75,582,150		
				Remaining Contingency %		2.10%		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Milestone Schedule & Status

Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	*Nov-15-017*	100% complete
Building Permit - South Campus	Jul. 7, 2017	*Nov-15-017*	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017		
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		
EC Solar Array	Jan. 10-19	***Dec 1-018***	*Confirmed by MSSL*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018		*Under review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017		*Under review*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	***Mar-18***	*Under review*
SC Structure Enclosed (Watertight)	Oct. 24-018	***Aug. 9-018***	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	***Dec-018***	
East Campus Early Occupancy	Jan. 2019	***Jan. 2, 2019***	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	***January to April 30th 2019***	*Confirmed by MSSL*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	***March 18th, 2019***	*Confirmed by MSSL*
Final Completion of DB Contract	Jun. 26, 2019	***May 13, 2019***	*Confirmed by MSSL*
HOL Operational	Jul. 2, 2019	***May 15th, 2019***	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1 Roof & Atrium Steel, Curtainwall – South (front) Elevation

Executive Status Report

Facility Renewal Program

EC1 Exterior Wall and Window Framing & Sheathing (north elevation)

Executive Status Report

Facility Renewal Program

EC2

EC Civil

HydroOttawa

Executive Status Report

Facility Renewal Program

Executive Status Report

Facility Renewal Program

EC Sanitary pumping station

Executive Status Report

Facility Renewal Program

Report #	**15**
Date of Report	**April 15th, 2018**
Report Period	**March 15th to April 15th, 2018**

Executive Summary

The project is ahead schedule and forecasted to be on budget. The substantial completion of the project is scheduled for March 18th, 2019, and Sullivan has confirmed the early occupancy by HOL of EC1 by January 1, 2019 to commence HOL fit-up.

Open design areas in the buildings are now limited to the main EC1 Lobby, EC1/SC fitness areas, signage and wayfinding. A full design presentation to HOL's EMT is being prepared, tentatively for May 9th. HOL Operational Integration and Change Management activities continued this period and will be ramping up as the project moves to completion. Critical HOL operational decisions necessary to proceed will be included in the planned EMT presentation meeting.

The Solar system design is in progress for both campuses, including a demonstration system at the main EC front visitor parking lot. The budget has been submitted and will be refined as design is finalized. The solar work is planned for completion by December 017 aligned with the main EC and SC schedules.

The furniture tender closed March 21rst and evaluations completed March 28th. The highest technical scoring Proponent, was also the lowest financial tender, and the tender within budget. The HOL contract was executed the April 11th and a start-up meeting scheduled for April 18th. The procurement was highly successful, specifically the work by the HOL Evaluation team. With the furniture supplier secured, HOL's divisional space and furniture planning strategy and implementation is a critical to launch.

Construction remains concentrated on the EC1 building, with exterior walls, curtainwall, windows, interior masonry and mechanical/electrical distributions. The EC1 watertight date of March 28th reported in last report has been extended to late May due to the late delivery of the main mechanical equipment and a glass quality issue – select glass units delivered to site were rejected by the Design Build team.

EC2 foundations, underground electrical and concrete slabs continue in preparation for masonry and steel. EC3 slab work will commence later this month, and East campus exterior civil works continue. The South Campus has been recommenced with work proceeding on concrete foundation and the remaining tree clearing.

The Design Build team closed the main East Campus (Hunt Club) road improvements (new intersection and HOL access roads) tender this period under the HOL cash allowance budget.

Key Construction Stats:

- 36% complete based on billings ending March 31rst, 2018
- No Lost time accidents over 389 days
- Average manpower on site 65
- +6807m3 of concrete poured to date

The property disposition team remains concentrated on satisfying the due diligence conditions for both Albion and Merivale. [redacted]

HydroOttawa

Executive Status Report

Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  o EC1 exterior wall / enclosures
  o EC1 Interior partitioning / M&E distributions
  o EC civil work
  o EC2 foundations and slabs on grade
  o SC reopened and foundation/concrete work
• Closed EC road work tender
• Closed HOL furniture tender
• Completed Alumni Focus Meeting
• Wayfinding and Signage design review
• Commissioning draft plan issued
• Operational Change Management and Migration planning advanced – HOL Alumni Focus meeting
• Solar design and program development advanced
	• EC1 exterior enclosure, interior wall framing, mechanical and electrical systems
	• EC2 concrete, block work for single story office;
	• EC3 concrete in washroom area;
	• Completion of millwork tender;
	• Solar design
	• HOL Migration and Policy planning, (continued development)
	• Signage and wayfinding design
	• Commence Control Room technology and console procurements

Significant Risks / Challenges	**Significant Opportunities**
• Unknown Site conditions (South campus - low); • Unapproved cost changes under review (not in forecast) and contingency management to completion; • The South Campus fire protection water holding system may need to increase in capacity anticipated by their design by 3 to 5x due to the height of the warehouse racking systems. This is being assessed by professionals from both Sullivan and verTerra; • HOL program change and integration (operational migration/change management streams) with construction; • HOL policy development (internal timeline risk); • Managing Design Build team cost and quality compliance.	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains.

Executive Status Report

Facility Renewal Program

Budget Status

- 47% complete based on billings ending March 31rst
- $45.6M expended to date including land
- $22.2M on the design build program (36%)
- $5.09M forecast against contingency
- $1.6M contingency remaining (increased from last period due to tender savings).

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions April 15th, 2018 (SIOC)	Current Forecast April 15th, 2018 (SIOC)	Invoiced To Date Mar. 31rst, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (13,970)	$ 3,712,714	$ 2,640,536	71%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,456,593	$ 4,385,201	$ 1,407,010	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,207,119	$ 61,994,435	$ 22,206,484	36%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (324,756)	$ 1,690,044	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (238,000)	$ 3,787,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,086,986)	$ 1,599,606	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 45,603,012**	47%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Milestone Schedule & Status			
Activity	Milestone Date	Forecast Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Revsied by MSSL*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18		*tendered Mar 018*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Confirmed by MSSL/OZZ*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018		*Under review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 8-018**	*Under review*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018		
SC Structure Enclosed (Watertight)	Oct. 24-018	**Aug. 9-018**	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	**Dec-31-018**	*Confirmed by MSSL/OZZ*
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	*Under review*
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1

EC2

Executive Status Report

Facility Renewal Program

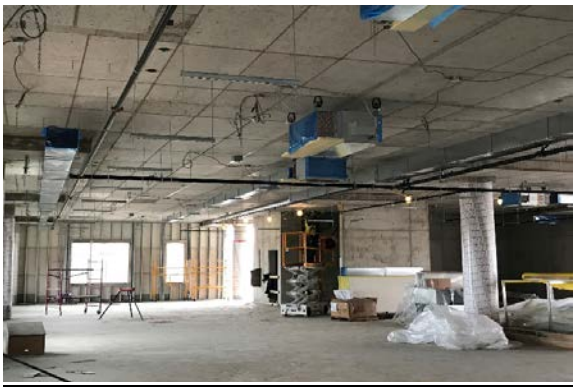
SC – work recommenced the week of April 9th

Executive Status Report

Facility Renewal Program

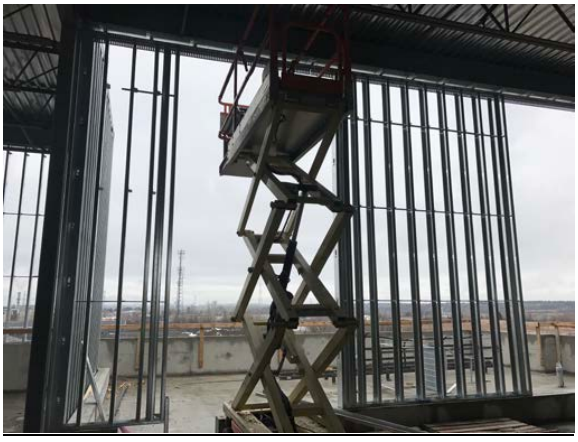
EC1 Various Interior development photos:

Typical floor (ductwork, fan-coils, cable tray



Level 1 washrooms

4th floor Wall studs



Executive Status Report

Facility Renewal Program

Report #	**16**
Date of Report	**May 15th, 2018**
Report Period	**April 15th to May 15th , 2018**

Executive Summary

The project is ahead schedule and forecasted to be on budget. The substantial completion of the project is scheduled for March 18th, 2019, and Sullivan has confirmed the early occupancy by HOL of EC1 by January 1, 2019 to commence HOL fit-up.

Open design areas in the buildings are now limited to the main EC1 Lobby, EC1/SC fitness areas, signage and wayfinding. A full design presentation to HOL's EMT is scheduled for May 23rd, 2018. HOL Operational Integration and Change Management activities continued this period and will be ramping up as the project moves to completion. HOL operational decisions necessary to proceed will be included in the planned EMT presentation meeting.

The Solar system design and approvals are in progress for both campuses, including a demonstration system at the main EC front visitor parking lot. The budget has been submitted and will be refined as design is finalized. The solar work is planned for completion by December 017 aligned with the main EC and SC completion schedules.

The furniture planning has commenced with the development of workstation, office and collaboration options for the EMT presentation. HOL's divisional space and furniture planning is planned to commence next period. Furniture design must be completed by August 018 to release manufacturing.

The food service RFP draft has been prepared and is scheduled to be released to market in June 2018. Procurements for HOL's System Office consoles, racking systems and logistics (moving) are being developed. HOL is procuring directly the POD technology for the Data Hall.

Construction continues on the EC1 exterior walls, curtainwall, windows, interior masonry and mechanical/electrical distributions. Membrane roofing commenced on EC1 which, when completed, will permit interior drywall and finishes to commence. EC1 is scheduled to be watertight by the end of May, except for the front atrium, which will remain open for access. EC2 office area foundations, underground electrical and concrete slabs are now complete and masonry walls proceeding for steel roof erection. EC3 concrete in the wash areas is also complete and masonry will commence next period. East campus exterior civil works continue with grading of the back property area, and service crossings at the front access road. A small pocket of contaminated fill was encountered at the EC2 transformer base location, but was not significant and resolved with minimal cost. The South Campus concrete foundations in the garage area are completed and pre-engineered steel commenced. Concrete foundations continue for the warehouse areas. Site clearing and grading continues.

Key Construction Stats:

- 41% complete based on billings ending March 31rst, 2018
- No Lost time accidents over 426 days
- Average manpower on site 101 (both sites)
- +7300m3 of concrete poured to date

The property disposition team remains concentrated on satisfying the due diligence conditions for both Albion and Merivale. [redacted]

HydroOttawa

Executive Status Report

Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  ○ EC1 exterior wall / enclosures / roofing
  ○ EC1 Interior partitioning / M&E distributions
  ○ EC civil work
  ○ EC2 foundations, slabs on grade & masonry
  ○ EC3 interior concrete slabs and masonry
  ○ SC foundation/concrete in garage completed, steel delivered
• Commissioning Start-Up meeting conducted
• Operational Change Management and Migration planning advancing
• Food Service RFP draft prepared
• Solar design and program development advanced
	• EC1 exterior walls complete (except for Atrium)
	• EC2 office area masonry and steel erection
	• EC3 concrete in washroom area
	• SC foundations and pre-engineered steel erection
	• Solar design and approval applications (both sites)
	• HOL Migration and Policy planning, (continued development)
	• Signage and wayfinding design
	• Food Service and Control Room technology and console procurements

Significant Risks / Challenges	**Significant Opportunities**
• Unknown Site conditions; • Unapproved cost changes under review (not in forecast) and contingency management to completion; • The South Campus fire protection water holding system may need to increase in capacity anticipated by their design by 3 to 5x due to the height of the warehouse racking systems. This may also require in-rack sprinkler systems and impact HOL's warehouse operations/use. This is being assessed by professionals from both Sullivan and verTerra; • HOL program change and integration (operational migration/change management streams) with construction; • HOL policy development (internal timeline risk); • Managing Design Build team cost and quality compliance.	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains.

HydroOttawa

Executive Status Report

Facility Renewal Program

Budget Status

- 51% complete based on billings ending Aprill 30th, 2018
- $48.8M expended to date including land
- $25.3M on the design build program (41%)
- $5.1M forecast against contingency
- $1.56M contingency remaining

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions May 10th, 2018	Current Forecast April 15th, 2018 (SIOC)	Invoiced To Date April 30th, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 36,030	$ 3,762,714	$ 2,727,119	72%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,406,593	$ 4,335,201	$ 1,407,010	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,242,119	$ 62,029,435	$ 25,373,784	41%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (324,756)	$ 1,690,044	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (238,000)	$ 3,787,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,121,986)	$ 1,564,606	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 48,856,895**	51%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Milestone Schedule & Status			
Activity	**Milestone Date**	**Forecast Date**	**Status**
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Revsied by MSSL*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov-1-018	*tendered Mar 018*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Design in progress*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018		
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 8-018**	*Revised date*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018		
SC Structure Enclosed (Watertight)	Oct. 24-018	**Aug. 9-018**	*Confirmed by MSSL*
SC Solar Array	Jan. 15-019	**Dec-31-018**	*Design in progress*
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	*Under review*
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1

EC2

Executive Status Report

Facility Renewal Program

Site Photos: South Campus

Executive Status Report

Facility Renewal Program

Report #	**17**
Date of Report	**June 15th, 2018**
Report Period	**May 15th to June 15th , 2018**

Executive Summary

The project is ahead schedule and forecasted to be on budget. However, contingency management to project completion is imperative. The forecast has been updated to include the recent EC2 and South Campus office and operational revisions and the finalization of all interior room and technology changes. Both campuses are in full construction and all new HOL scope changes will impact construction, be at a premium cost, and reduce construction efficiencies which could delay schedule. The furniture scope of work heading into HOL Neighborhood planning will need to be closely monitored for scope and budget, but also could present cost saving opportunity if smaller workstations mobilized where possible.

On design, both the EC2 and South Campus office and operational area revisions were finalized this week and have released to the construction team. Development of the EC1 Lobby graphic has progressed and concepts will be presented June 25th. Similarly, the EC1/SC fitness area equipment, signage and wayfinding are to be finalized this period. [redacted] Procurement of the Food Service Operator is to be released by the end June, with HOL's System Office consoles immediately following in July. Warehouse racking and shelving systems and migration logistics procurements are being developed. HOL closed the Data Hall POD procurement but the award has not been finalized.

HOL Operational Integration and Change Management activities continued this period. Operational focus meetings with Warehouse, Facilities, Operations, Stations and Metering are scheduled to enable the development of a detailed migration plan and schedule. Office area Neighborhood Space Planning with the Management teams is scheduled to occur this month, with detailed divisional team planning to follow in July. This is a critical phase of the project with the furniture order for manufacturing set for August 018.

[redacted]

Construction continues on the EC1 exterior walls, curtainwall, windows, interior masonry and mechanical/electrical distributions. Interior framing is mostly complete on all levels and drywall commenced on levels 1 and 2. EC2 office area steel structure is complete and masonry walls proceeding – interior mechanical, electrical and masonry work on EC2 office area was stopped due to the recent design revisions to mitigate impact costs. Insulated panels for both EC2 and EC3 will commence this period. East campus exterior civil works continues in preparation for internal roads and parking lots. Hunt Club road work will commence later this month in a phased approach to minimize traffic congestion. The South Campus concrete foundations are complete and the pre-engineered steel for the garage also complete, the warehouse steel has commenced. Underground work for interior office and metering areas was stopped to minimize costs while the design of these areas was being revised. Site work and grading continues, and perimeter fencing commenced.

Key Construction Stats:

- 48% complete based on billings ending May 31rst, 2018
- No Lost time accidents over 465 days
- Average manpower on site 125 (both sites)
- +10,568m3 of concrete poured to date

Executive Status Report

Facility Renewal Program

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  ○ EC1 exterior wall / enclosures / roofing
  ○ EC1 Interior partitioning / M&E distributions
  ○ EC civil work
  ○ EC2 masonry (office / storage areas)
  ○ EC2 single storey steel
  ○ SC foundation walls in warehouse
  ○ SC warehouse steel commenced
• EMT design and furniture presentation
• EC2 and SC redesign completed
• Operational Change Management and Migration focus meeting scheduled
• Control Room design and budget finalized
• System Technology review meeting conducted, equipment and budget finalized
• Signage and wayfinding review meeting
• Food Equipment tender (by Sullivan) released
	• EC1 exterior walls completed (except for Atrium)
	• EC2 office area masonry
	• EC2 and EC3 wall panels
	• SC pre-engineered steel erection at warehouse
	• Solar design and approval applications (both sites)
	• Hunt Club road work to commence
	• HOL Operational Migration focus sessions
	• HOL P4 Policy program (continues)
	• Neighborhood planning and divisional furniture designs to commence
	• Fitness Centre equipment to be finalized
	• Signage and wayfinding design to be completed
	• Food Service and Control Room technology and console procurements
	• Albion Rd., severance application to be made to City
	• Merivale conditions to be closed off by purchaser

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management to completion; • The South Campus fire protection water holding system may need to increase in capacity anticipated by their design by 3 to 5x due to the height of the warehouse racking systems. • HOL program change and integration (operational migration/change management streams) with construction; • HOL policy development (internal timeline risk); • Managing Design Build team cost and quality compliance. • Unknown Site conditions	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains. • Neighborhood planning cost saving potential for smaller workstations.

HydroOttawa

Executive Status Report

Facility Renewal Program

Budget Status

- 55% complete based on billings ending Aprill 30th, 2018
- 53.2M expended to date including land
- $29.8M on the design build program (41%)
- $5.6M forecast against contingency
- $1M contingency remaining

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions May 28th, 2018	Current Forecast May 28th, 2018	Invoiced To Date May 31st, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 86,030	$ 3,811,794	$ 2,725,602	72%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,554,052	$ 4,482,660	$ 1,412,236	32%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,603,687	$ 62,391,003	$ 29,758,693	48%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (324,756)	$ 1,690,044	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (238,000)	$ 3,787,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,681,013)	$ 1,005,579	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,499,080**	**$ 53,245,514**	55%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Milestone Schedule & Status			
Activity	**Milestone Date**	**Forecast Completion Date**	**Status**
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov-1-018	*Work to commence in late June 018*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Design in progress*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018		
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 8-018**	*Revised date*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018		
SC Structure Enclosed (Watertight)	Oct. 24-018	**Aug. 9-018**	*Under review*
SC Solar Array	Jan. 15-019	**Dec-31-018**	*Design in progress*
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	*Under review*
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos: East Campus

EC1

Drywall Level 1

Executive Status Report

Facility Renewal Program

EC2

Executive Status Report

Facility Renewal Program

Site Photos: South Campus

Executive Status Report

Facility Renewal Program

Report #	**18**
Date of Report	**July 15th, 2018**
Report Period	**June 15th to July 15th , 2018**

Executive Summary

The project remains ahead schedule and forecasted to be on budget. However, the EC2 and SC schedules are being revised due the recent design changes directed by HOL. The budget forecast has realized some savings resulting from reductions to projected consulting fees for 2019 and the final cash allowance values for yard lighting and base building signage. Additional savings may result from HOL's decision to standardize most open office workstations to 6'x6", but this will be better known when the final furniture layouts are completed. On changes, Sullivan has requested that HOL and verTerra limit, if not stop all together, further scope changes as there is no longer the ability to absorb within the program schedule.

On design, both the EC2 and South Campus office and operational area revisions had a greater impact to the schedule than previously understood by Sullivan but construction is proceeding. The EC1 Lobby graphic concepts were presented to HOL this period and direction received to advance to final design. The EC1/SC fitness area equipment design was finalized and will be released for tender in August. Interior/Exterior operational signage and wayfinding review is ongoing with a forecasted tender in September. [redacted] HOL IT finalized the order on the Data Hall POD and construction coordination now in progress. Procurement of the Food Service Operator is scheduled for market release by August 3rd, 2018. Warehouse racking and operational shelving systems has also been released for market pricing. The staff and operational migration/logistical procurements are been developed with HOL Supply Chain.

HOL Operational Integration and Change Management activities continued this period. Operational focus meetings with Warehouse, Facilities, Stations and Metering were completed and the development of a detailed migration plan and schedule is ongoing – a final Operational tour and focus session is occurring next week. A mock-up of the main workstations and collaborative areas was installed in the Albion cafeteria for staff feedback. Phase 1 of the Neighborhood furniture planning was completed with all HOL divisions. Phase 2, which will finalize the furniture plans, is scheduled for the week of July 23rd. Completion of the furniture plans by August 1, 2018 is critical to permit cabling distribution in EC1, assess budget and release the furniture order.

All elements of Solar system design have been finalized and final engineered design set for mid-August. Approval submissions were completed for the CIA (Hydro Ottawa) and EASR (MOE) this period and the schedule is back on track. The solar budget forecast remains over plan (+/- 150K), but savings are anticipated, primarily from the civil scope and wiring labour, and a revised budget submission expected by mid-August.

Construction continues on all areas of EC1 exterior and interior; curtainwall at lobby, final brick, roofing, interior drywall partitions, painting and mechanical/electrical distributions, including the main mechanical areas. EC1 main power systems will be in place by next period with permanent power now forecast for September. EC2 office areas were essentially stopped awaiting the design finalization of the interior changes. However, worked proceeded in the EC2 garage area, with drainage systems and wall panel preparation. EC2 garage concrete slabs will be completed this month. Insulated wall panels commenced on EC3, as did drainage systems. Concrete slabs for EC3 will be completed this period. East campus exterior civil works continues in preparation for internal roads and parking lots. Hunt Club road work did not commence, awaiting a Road Cut Permit by the City, but will shortly.

The South Campus pre-engineered steel for the garage and warehouse are now complete and load bearing masonry commenced to permit structural steel of the office area. Underground work for interior office and metering areas was stopped awaiting the revised design but is now recommenced. Various site work such as grading continues, perimeter fencing and temporary power systems advanced. The water well was drilled and tested, with stable water achieved at 180' deep – this is much less depth than anticipated and removes this risk from program.

Sullivan submitted the revised water tank/sprinkler/fire protection calculations to the City and City feedback received

HydroOttawa

Executive Status Report

Facility Renewal Program

– a positive development but more calculations were requested by the Fire Department. Sullivan has ordered water tanks to avoid project delay and in advance of presenting a claim to the HOL. We will continue to monitor this situation closely.

Key Construction Stats:

- 53% complete based on billings ending June 30th, 2018
- No Lost time accidents over 495 days
- Average manpower on site 125 (both sites)
- +/-11,000m3 of concrete poured to date

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  o EC1 exterior wall / enclosures / roofing
  o EC1 Interior partitioning / M&E distributions
  o EC civil work – light bases, duct-banks, grading, etc.
  o EC2 parapets, garage drainage and concrete
  o EC3 wall panels, drainage and concrete
  o SC garage and warehouse steel completed
  o SC load bearing masonry
  o SC various site development work
  o SC water well drilled and tested
  o Solar design and approval applications
• Furniture mock-up & meeting rm. technology installed in Albion
• Phase 1 HOL Neighborhood Furniture planning
• EC2 and SC redesign completed
• Operational Migration focus sessions completed (except for operations)
• Food Equipment tender closed by Sullivan
• Control Room Console Tender released
• Fitness Equipment design and tender scope developed
• Lobby Graphic Design review with HOL
	• EC1 exterior walls fully complete (except for construction access points)
	• EC1 drywall, painting, mechanical /electrical equipment and distributions
	• EC2 office area masonry to recommence
	• EC2 and EC3 garage area concrete
	• EC2 and EC3 exterior wall panels
	• Hunt Club road work to commence
	• Phase 2 of Neighborhood planning and final furniture design completed
	• Signage and wayfinding design to be completed
	• Lobby Graphic design to be advanced
	• Control Room console tender award
	• Food Service and Fitness Equipment procurement to be issued
	• Albion Rd., severance application to be made to City

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, including trade pricing and schedule impact ; • The South Campus fire protection water holding system risk and claim potential; • HOL program change and integration (operational migration/change management streams) with construction; • Managing Design Build team cost and quality compliance.	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains. • Neighborhood planning cost saving potential for smaller workstations.

Executive Status Report

Facility Renewal Program

Budget Status

- 74% complete based on billings ending June 30th, 2018
- 55.5M expended to date including land
- $33.08M on the design build program (53%)
- $5.51M forecast against contingency
- $1.174M contingency remaining (a gain of $120K from last period)

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions July 12th, 2018	Current Forecast July 12th, 2018	Invoiced To Date June 30th, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 56,030	$ 3,781,794	$ 2,800,093	74%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 1,882,683	$ 4,332,131	$ 324,391	7%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,709,985	$ 62,497,301	$ 33,038,760	53%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 17,982	1%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (263,000)	$ 3,762,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,511,908)	$ 1,174,684	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,499,080**	**$ 55,512,226**	58%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule
- Finalization of the HOL migration schedule into the construction plan continues.

Milestone Schedule & Status			
Activity	**Milestone Date**	**Forecast Completion Date**	**Status**
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov-1-018	*Work to commence in late June 018*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Design and approvals in progress*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018	**Aug 30th**	*Revised date per MSSL*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 30th-018**	*Revised date per MSSL*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	**Aug 30th-018**	*Inpacted by Design Changes*
SC Structure Enclosed (Watertight)	Oct. 24-018	**Aug 30th-018**	*Inpacted by Design Changes*
SC Solar Array	Jan. 15-019	**Dec-31-018**	*Design and approvals in progress*
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	*SC Under review*
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*SC Under review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Site Photos: East Campus

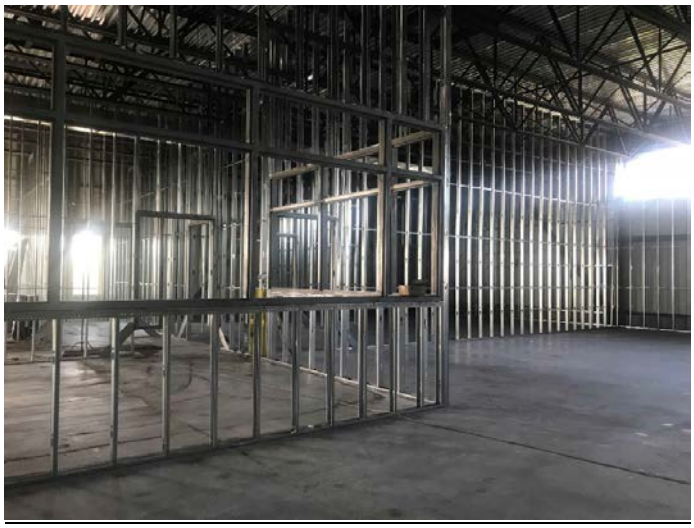
EC1 Hunt Club Elevation

EC1 Lobby Glazing – View to Hunt Club

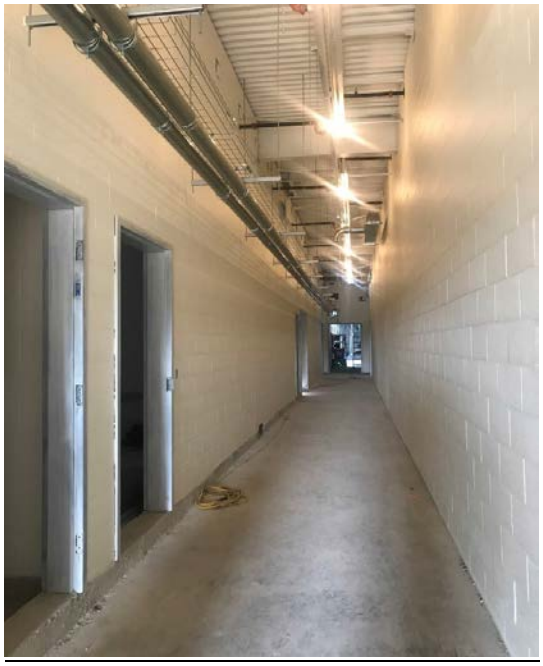
Executive Status Report

Facility Renewal Program

EC1 Control Room/ICC Framing



EC1 Mechanical Areas (painted)



EC2 from east

EC2 from South (and civil work, parking lot grading, light pole bases)

Site Photos: South Campus

Executive Status Report

Facility Renewal Program

Executive Status Report

Facility Renewal Program

Report #	**19**
Date of Report	**August 15th, 2018**
Report Period	**July 15th to August 15th , 2018**

Executive Summary

The project remains ahead schedule with EC1 planned for turn-over to HOL to commence fit-out January 2nd, 2019. However, the EC2 and SC buildings realized an approximate three week delay due to the interior changes made by HOL. This delay is being assessed by verTerra to determine the impacts on HOL's migration planning. The project is forecasted to be on budget but contingency management remains a management imperative.

Open design and procurements advanced this period; the EC1 lobby graphic design operational signage and wayfinding finalized this period, excluding the selection of the final HOL historic photos which are to be provided this week. The signage and wayfinding work will be procured in September. Design of the warehouse racking and operational shelving continued development with the intent to be finalized and ordered in September. [redacted] The Data Hall POD order was closed by HOL but a major change to the EC1 roof is now required to accommodate a revised HOL POD design. The procurement package for the Food Service Operator has been delayed to resolve scope issues but is close to completion. The procurement package for the EC1 & SC fitness equipment was finalized and will be issued to market this month. The operational migration/logistical tender scope has been drafted for initial review and the tender remains on schedule for release in October. The Solar designs plans for both campus have been finalized, except for minor elements, and Sullivan is preparing and final budget for review on August 22nd. The solar team is awaiting CIA (HOL) and EASR (MOE) approvals but anticipate no issues.

HOL Operational Integration and Change Management activities progressed on all fronts. verTerra developed a comprehensive HOL migration schedule, setting the plan for HOL's migration into the new facilities starting in January 2019. This plan was reviewed with the HOL OPS teams and will continue to be refined with HOL. Phase 2 of the Neighborhood planning, setting all furniture requirements and staff seat locations, was completed this period, with only [redacted] requiring some minor revisions - a major achievement! verTerra is awaiting final sign-offs to finalize the furniture the order but was able to release cabling distribution on the plans developed to maintain schedule. The furniture team will now focus on the cafeteria and various other areas not covered within the neighborhood planning. It is the intent to have all furniture designed and approved by August 31rst.

Construction continues in all areas of EC1 exterior and interior; exterior metal panels at the lobby area, final exterior masonry, interior drywall partitions and mechanical/electrical distributions – flooring will commence next period. EC2 office areas have recommenced and concrete, masonry and exterior wall panels advanced. EC2 garage concrete also will commence this week. EC3 exterior wall panels and preparation for concrete proceeded this period as well. Exterior civil works included grading for internal roads, u/g power and site lighting, and the Hunt Club road work crews mobilized and work commenced.

The South Campus is also in full swing, with the garage and warehouse steel erected, load bearing masonry and one-third of the warehouse concrete slab poured. Underground work for interior office and metering areas advanced in preparation for concrete. Site development work for the parking, exterior yard and solar areas continued.

On the SC sprinkler matter, Sullivan advised that the City and Fire Department are close to finalizing acceptance of Sullivan's 50,000 litre storage proposal (best case) with all technical criteria addressed with the City. Sullivan expects City feedback this week but verTerra feels this may be optimistic.

Key Construction Stats:

- 61% complete based on billings ending June 30th, 2018 (including cash allowances)
- No Lost time accidents over 525 days
- Average manpower on site +110 (both sites)
- +/-11,500m3 of concrete poured to date

HydroOttawa

Executive Status Report

Facility Renewal Program

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  o EC1 exterior wall / enclosures / roofing
  o EC1 Interior partitioning / M&E distributions
  o EC civil work – light bases, duct-banks, grading, etc.
  o EC2 parapets, garage drainage and concrete preparation
  o EC3 wall panels, drainage and concrete preparation
  o SC load bearing masonry
  o SC various site development work
  o Solar design
• Phase 2 Neighborhood / Furniture Planning
• Operational Migration Schedule/Plan developed
• HOL Data Hall POD design order released
• EC1 Control Room console tender closed
• EC1/SC Fitness tender prepared
• Signage/Lobby Graphic and Wayfinding scope determined
• EC Private Drainage Agreement issued to adjacent land owners
	• EC1 exterior metal panels
	• EC1 drywall, painting, mechanical /electrical equipment and distributions, flooring
	• EC1 technology cabling and sound masking
	• EC2 masonry and concrete
	• EC3 warehouse concrete
	• EC2 and EC3 exterior wall panels, roof and doors
	• EC site-work and Hunt Club road work
	• SC masonry, office steel and concrete
	• SC site-work
	• Furniture design finalization
	• Signage, wayfinding an Lobby design (for procurement)
	• Food Service and Fitness Equipment procurement to be issued
	• Albion Rd., severance application to be made to City

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, including trade pricing and schedule impacts ; • The South Campus fire protection water holding system risk and claim potential; • HOL program change and integration (operational migration/change management streams) with construction; • Unknown Site conditions (East Campus Hunt Club)	• Integrating Hydro Ottawa's history into the design and branding of the new facilities; • Revised HOL Policy and work processes efficiency gains.

Executive Status Report

Facility Renewal Program

Budget Status

- 63% complete based on billings ending July 31rst, 2018
- 60.8M expended to date including land
- $36.5M on the design build program (58%)
- $5.57M forecast against contingency
- $1.12M contingency remaining

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Aug 14th, 2018	Current Forecast Aug 14th, 2018	Invoiced To Date July 31rst, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 56,030	$ 3,781,794	$ 2,815,107	74%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 1,927,500	$ 4,377,026	$ 2,140,798	49%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 3,724,126	$ 62,511,442	$ 36,523,125	58%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 43,285	3%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (263,000)	$ 3,762,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (5,570,944)	$ 1,115,648	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,499,080**	**$ 60,853,315**	63%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule but the EC2 and SC schedules incurred a 3 week delay (under review by verTerra).

Milestone Schedule & Status			
Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov-1-018	*In progress*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Design finalized*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018	**Aug 30th**	*Under Review*
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 30th-018**	*Revised date per MSSL*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	**Aug 30th-018**	*Under Review*
SC Structure Enclosed (Watertight)	Oct. 24-018	**Aug 30th-018**	*Under Review*
SC Solar Array	Jan. 15-019	**Dec-31-018**	*Design finalized*
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	*EC2 and SC Under review*
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under Review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos:

EC1 Hunt Club Elevation

EC1 Rear Elevation at Cafeteria

Executive Status Report

Facility Renewal Program

EC2 (July & August 15th)

Executive Status Report

Facility Renewal Program

EC3:

Executive Status Report

Facility Renewal Program

South Campus - Buildings

South Campus – Site Work

Executive Status Report

Facility Renewal Program

Report #	**20**
Date of Report	**September 17th, 2018**
Report Period	**August 15th to September 15th , 2018**

Executive Summary

The project remains on budget and on schedule. HOL's operational migration sequence has been revised as the construction schedule was impacted by the interior changes made on EC2 and the SC, but migration will remain within overall the planned May 15th, 2019 operational date.

Open design and procurements advanced this period; the EC1 lobby graphic design timelines and photos have been selected and a special team (HOL and verTerra), including the graphic specialist, will be established to complete the work. The signage and wayfinding design for procurement is near completion and will be released for tender under Sullivan this period. The warehouse racking and operational shelving design has been finalized and is being priced for approval. [redacted] The technical requirements for the EC1 Data Hall POD and cooling equipment is closed and deliveries being coordinated with the construction team. The RFP for the Food Service Operator was finalized this period and will be released by September 30th. The procurement package for the EC1 & SC fitness equipment closed and will be evaluated this week. A Request for Information (RFI) for operational migration/logistical providers was issued to the market and will be used to select RFP participants. [redacted]

HOL Operational Integration and Change Management activities continued on all fronts. Weekly issues calls with the Project Steering Committee Chairs and key managers have been established to track and action "urgent" decisions. Furniture planning for main staff areas is now complete and all other open areas being developed.

Construction continues in all areas of EC1 exterior and interior with a targeted focus on [redacted] Data Hall areas and exterior site and roadway works. Main power for the campus was energized September 12th and all main mechanical equipment is in place. EC2 exterior envelope, masonry, roofing and garage driveway concrete are all progressing. EC3 exterior wall/roof panels and the concrete slabs are complete.

South Campus construction is focused on the remaining structural steel (office area), envelope systems and exterior site work in advance of winter. The revised sprinkler design was approved by City of Ottawa and HOL/Sullivan reached agreement on cost assignment - this risk is now closed. verTerra was advised that the MOE is withholding its environmental approval for the SC based on a subsequent review and a new concern on groundwater impacts from HOL's operations. The team is awaiting MOE review comments and will escalate as required to resolve.

Key Construction Stats:

- 67% complete based on billings ending August 31rst, 2018 (including cash allowances)
- No Lost time accidents over 597 days
- Average manpower on site +/-130 (both sites)
- +/-12,500m3 of concrete poured to date

[redacted]

Executive Status Report

Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  o EC1 exterior wall / enclosures / roofing
  o EC1 Interior partitioning / M&E distributions
  o EC1 technology cabling and sound masking system installations commenced
  o EC civil work – light bases, duct-banks, grading, and Hunt Club road works etc.
  o EC2 metal roof, parapets, membrane roof, exterior masonry, M&E distributions and garage concrete
  o EC3 concrete, interior masonry and M&E distributions
  o SC load bearing masonry, underground M&E, concrete, civil works
  o SC revised sprinkler design approved by City
  o Solar design finalized
• Phase 2 Neighborhood / Furniture Planning complete
• Operational Migration planning development
• Fitness tender closed
• Food Services RFP scope developed
• Logistical (move) RFI for operations issued to market
• HOL Data Hall POD and cooling units scheduled for installation
• EC1 Control Room console design revisions complete
• Signage/Lobby Graphic and Wayfinding scope determined – design being finalized
• Albion Rd., severance application approved by City COA
• EC Private Drainage Agreement issued to adjacent land owners
	• EC1 exterior metal panels (delayed)
	• EC1 drywall, painting, mechanical /electrical equipment and distributions, flooring
	• EC1 technology cabling and sound masking- con't
	• EC2 envelope and concrete in garage and office,
	• EC3 warehouse concrete
	• EC site-work and Hunt Club road work
	• SC office steel, masonry, and concrete
	• SC site-work
	• Furniture design order released
	• Signage, wayfinding an Lobby design procured
	• Food Service and Fitness Equipment procurement released

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, including trade pricing and schedule impacts ; • HOL program change and integration and decision making on the operational migration/change management streams with construction;	• Revised HOL Policy and work processes efficiency gains.

Executive Status Report

Facility Renewal Program

Budget Status

- 67% complete based on billings ending August 30th, 2018
- $64.4M expended to date including land
- $39.9M on the design build program (64%)
- $6.03M forecast against contingency
- $.657M contingency remaining.

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Aug 23rd, 2018	Current Forecast Sept 15th, 2018	Invoiced To Date Aug 31rst, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 60,680	$ 3,786,444	$ 2,907,448	77%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 1,962,500	$ 4,412,026	$ 2,140,798	49%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 4,142,914	$ 62,930,230	$ 39,988,677	64%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 43,285	3%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (263,000)	$ 3,762,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,029,381)	$ 657,211	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,499,080**	**$ 64,411,207**	67%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of schedule but the EC2 and SC schedules incurred a 2-3 week delay but Sullivan has confirmed no change to forecasted substantial completion date.

Milestone Schedule & Status			
Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov-1-018	*In progress*
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Design finalized*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	***Revised date per MSSL***
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Aug 30th-018**	*Revised date per MSSL*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	*complete*
SC Structure Enclosed (Watertight)	Oct. 24-018	**Nov. 30th-018**	***Revised date per MSSL***
SC Solar Array	Jan. 15-019	**Dec-31-018**	***Under Review***
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up (Control Rm /IT) & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**March 18th, 2019**	***Confirmed by MSSL***
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under Review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos:

EC1 Hunt Club Elevation

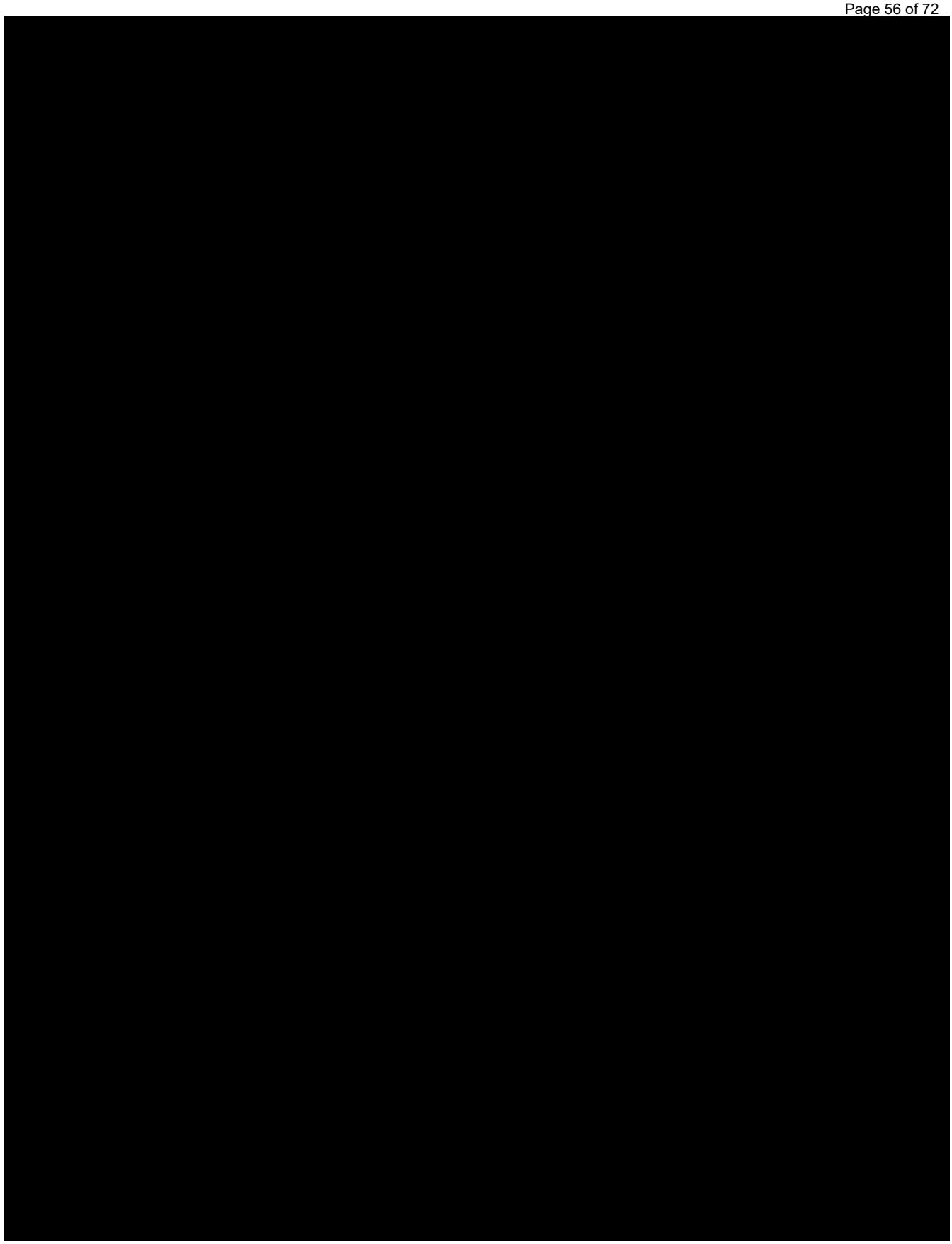
EC2

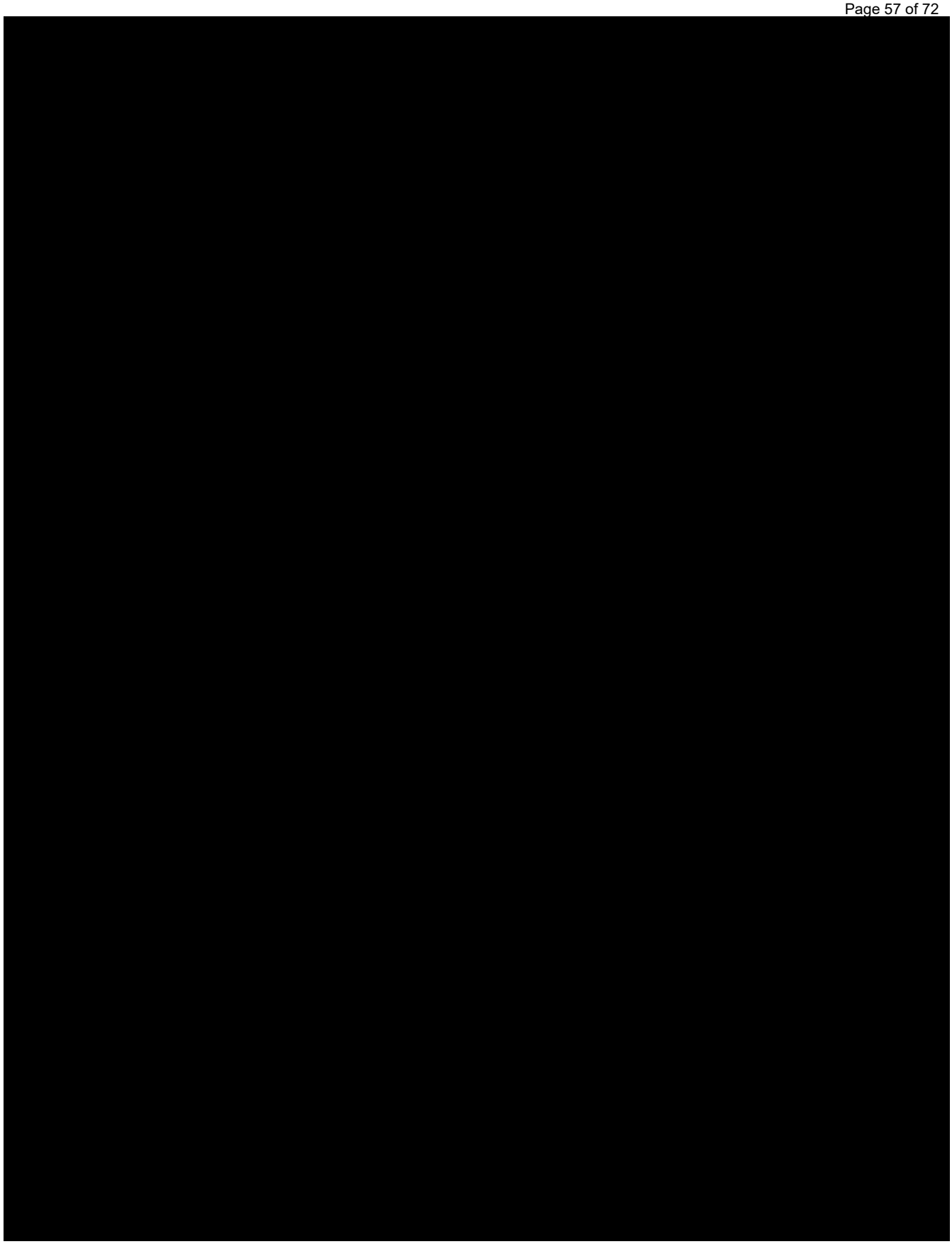
EC3: concrete slab poured

Executive Status Report

Facility Renewal Program

South Campus - Buildings





Executive Status Report

Facility Renewal Program

Report #	**21**
Date of Report	**October 15th, 2018**
Report Period	**September 15th to October 15th , 2018**

Executive Summary

The project remains on budget and on schedule. However contingency expenditure last period was significant due to final trade pricing for approved HOL changes higher than forecast and new scope added to plan for IT and operations ie: Data Hall fit-out requirements and racking scope.

Significant progress was made on many HOL fronts last period:

- ✓ The main furniture system designs have been signed off and will be ordered this month.
- ✓ EC1 lobby graphic has been selected, the working team structured and work proceeding.
- ✓ The signage and wayfinding design was completed and with verTerra for procurement.
- ✓ The warehouse and OPS racking scope was finalized and costed, the yard racking systems remain under assessment – main racking will be ordered this period. Note, new racking was not in the original FRP plan as assumption was that external yard racking would be moved from Merivale. To achieve Merivale disposition price, racking was an inclusion for the purchaser.
- ✓ The EC1 POD and condensers are scheduled for site delivery November 5th, and all technical and logistical issues settled. Connections being completed under the design build contract [redacted]
- ✓ The RFP for the Food Service Operator was finalized and issued to the market.
- ✓ The tender for the EC1 & SC fitness equipment was evaluated and the vendor selected - contract in progress.
- ✓ The Request for Information (RFI) for operational migration/logistical providers closed, but response poor. Alternate strategies to be developed.
- ✓ The solar designs and approvals are complete and budget now under plan with new SC array scale and foundation approach. Ordering of the panels occurred this period.
- ✓ LEED status review confirmed the two campuses will safely achieve LEED GOLD Certification, in fact both facilities are forecast to be only 10 LEED pts., away from LEED Platinum.

HOL Operational Integration and Change Management activities continued with the teams now moving into more detailed migration planning and preparation issues. The HOL migration schedule has been adjusted to commence in February vs January 019 with no planned impact to achieving May 15th, 2019 complete occupancy. The main people moves will occur starting in late April 2019 and occur over 3 weekends and will coincide with the May 15th 2019 milestone. Weekly issues calls with the Project Steering Committee Chairs and key managers have been highly effective as is seen by the work completed this period.

Construction continues in all areas of EC1 exterior and interior with a targeted focus on the fourth floor Control Room, Data Hall areas and exterior site and roadway works. EC2 exterior envelope, masonry, roofing and garage concrete all progressed and interior office area finishing ramped up. EC3 focused on the remaining interior areas and fit-up, the main doors and bridge crane will commence next period. The next two months will see significant development on the East Campus with turn-over for HOL fit-up scheduled for late December.

South Campus construction is also in full swing on all areas, the focus being completing the structural steel, envelope/exterior wall systems and the exterior site work and asphalt in advance of winter. Weather risk is now very real for the project and Sullivan has increased field production and crew shifts (on both sites). The MOE storm water approval risk remains open, but the MOE review is no longer focussing on presence of pressure treated wood poles, but rather design of the stormwater pond. With that update, risk is transferred to Sullivan.

Key Construction Stats:

- ➢ 68% complete based on billings ending September 30th, 2018 (including cash allowances)
- ➢ No Lost time accidents over 639 days

HydroOttawa

Executive Status Report

Facility Renewal Program

- Average manpower on site +/-130 (both sites)
- +14,000m3 of concrete poured to date

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  ○ EC1 exterior walls (metal panels) at the main lobby, cooling tower and loading dock
  ○ EC1 Interior partitioning and painting all levels
  ○ M&E terminations in main equipment rooms
  ○ EC1 technology cable distribution and racking
  ○ EC interior lot site work, curbs, landscape
  ○ EC Hunt Club road work/ intersection
  ○ EC2 garage ramps M&E roof tops and interior distributions
  ○ EC3 concrete, interior masonry and M&E distributions
  ○ SC load bearing masonry, structural steel, roofing, M&E distributions , concrete, civil w
  ○ Solar foundation design – solar panels ordered
  ○ EC1 Building Sign installed
• Fitness tender awarded
• Food Services RFP issued to market
• Logistical (move) RFI for operations closed
• [redacted]
• Racking systems finalized
• Signage/Lobby Graphic and Wayfinding scope in procurement
	• EC1 drywall, painting, mechanical /electrical equipment and distributions, flooring, millwork
	• EC1 4th Control Rm. / Data Hall floor painting, access floor and painting
	• EC1 technology systems
	• EC2 envelope and concrete in garage and office, M&E distributions, drywall
	• EC3 warehouse concrete
	• EC Landscape work and exterior site work near completion
	• EC Hunt Club road work / traffic signalization
	• SC office steel, masonry, and concrete
	• SC site-work
	• Furniture order released
	• Racking order released
	• Signage contracts secured
	• HOL's Data Hall PODS delivered.
	• Solar racking ordering released

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, including trade pricing, schedule impacts • Weather risk and delays to exterior works EC and SC • Compression affect (multiple trades and HOL fit up simultaneously)	• Revised HOL Policy and work processes efficiency gains.

Executive Status Report

Facility Renewal Program

Budget Status

- 71% complete based on billings ending September 30th, 2018
- $68.15M expended to date including land
- $43.4M on the design build program (68%)
- $6.3M forecast against contingency
- $.383M contingency remaining (.5% of capital, less land and contingency).

ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Oct. 15th, 2018	Current Forecast Oct 15th, 2018	Invoiced To Date Sept. 30th, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ 80,680	$ 3,807,364	$ 2,972,769	78%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 1,967,500	$ 4,417,026	$ 2,319,523	53%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 4,642,064	$ 63,429,380	$ 43,392,572	68%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 139,397	9%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (513,000)	$ 3,512,000	$ -	0%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,303,532)	$ 383,060	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 68,155,261**	71%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 15th, 2019.

Milestone Schedule & Status			
Activity	**Milestone Date**	**Forecast Completion Date**	**Status**
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	**Nov. 30th-018**	***Revised date per MSSL***
EC Solar Array	Jan. 10-19	**Dec-31-018**	*Panels Ordered. Testing tbd.*
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	*100% complete*
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	***Revised date per MSSL***
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	*100% complete*
EC3 Enclosed (Watertight)	Dec. 11-017	**Nov 1rst. 2018**	*Revised date per MSSL*
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	*complete*
SC Structure Enclosed (Watertight)	Oct. 24-018	**Nov. 30th-018**	*Panels Ordered. Testing tbd.*
SC Solar Array	Jan. 15-019	**Dec-31-018**	***Under Review***
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	*Confirmed by MSSL*
HOL Fit-Up & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**April 2nd 2018**	***Revsised Date per MSSL***
Final Completion of DB Contract	Jun. 26, 2019	**May 13, 2019**	*Under Review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos:

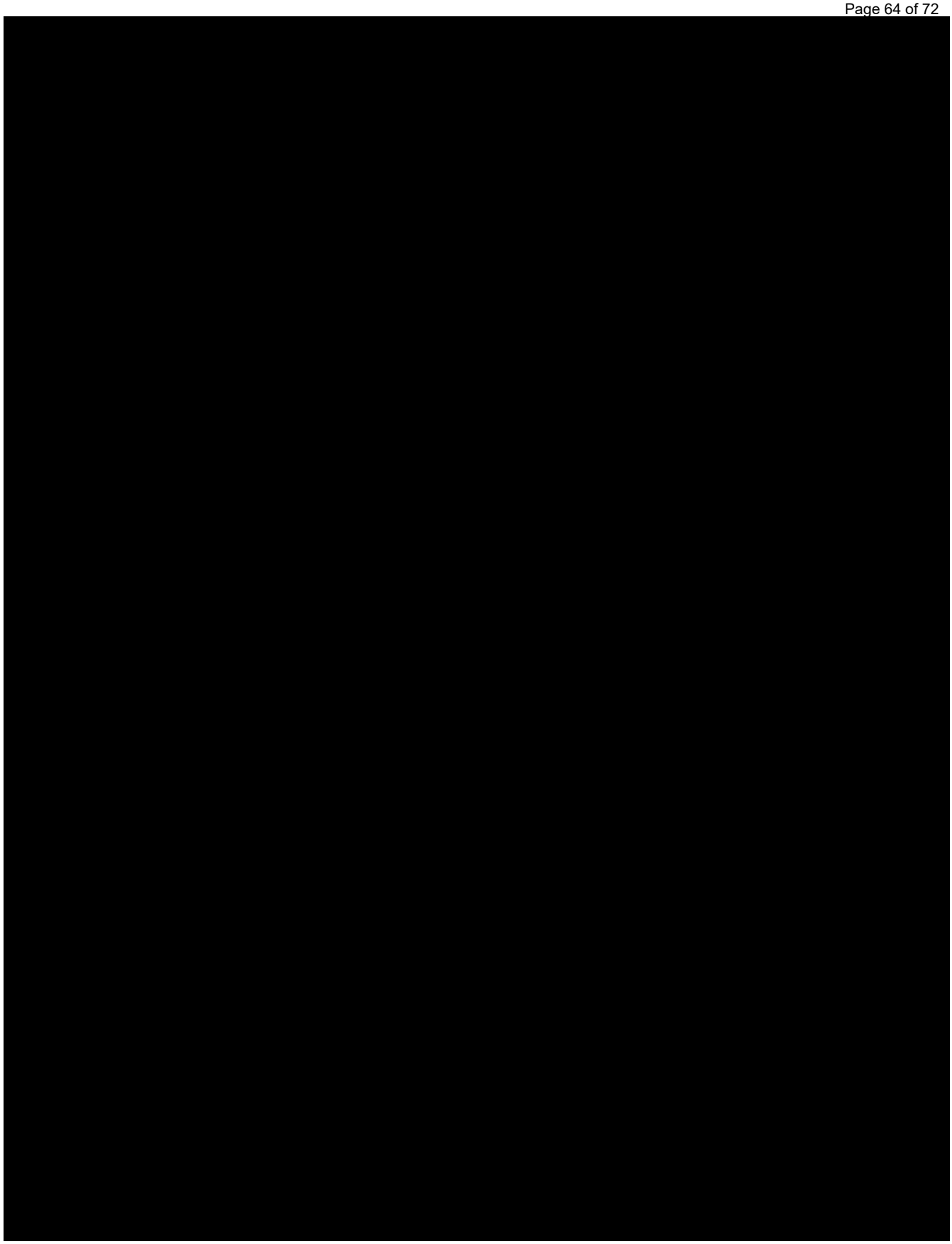
EC1 Hunt Club Elevation

EC2

EC3 (masonry enclosures/ service rooms).

South Campus – Buildings west elevation

Garage: East elevation



Executive Status Report

Facility Renewal Program

Report #	**22**
Date of Report	**December 15th, 2018**
Report Period	**October 15th to December 15th , 2018**

Executive Summary

The project remains on budget and on schedule. However, the contingency management and cost containment to completion is critical to ensure completion on schedule.

Progress continues over all HOL's operational and change management fronts:

- ✓ Advance furniture orders have been released (Facilities, [redacted] and 3rd floor) – furniture will begin arriving on site December 17th
- ✓ [redacted]
- ✓ EC1 lobby graphic design continues
- ✓ The signage and wayfinding design and manufacturing commenced
- ✓ The warehouse and OPS racking scope and design was finalized and has been ordered
- ✓ The EC1 POD and condensers were delivered, installed and are near completion
- ✓ The RFP for the Food Service Operator closed with 3 proponents and is under evaluation
- ✓ The tender for the EC1 & SC fitness equipment is complete and released for manufacturing
- ✓ The operational/warehouse migration scope of work is being revalidated (cost and schedule) by vendors
- ✓ HOL IT/Cabling/Audio visual and Security system infrastructures continue – the System Office main video wall has been delivered to site.

HOL Operational Integration and Change Management activities continue with the teams now moving into more detailed migration planning and preparation issues. The HOL migration schedule has been adjusted to commence in February vs January 019 with no planned impact to achieving May 15th, 2019 complete occupancy. The main people moves will occur starting in late April 2019 and occur over 3 weekends and will coincide with the May 15th, 2019 milestone. Weekly issues calls with the Project Steering Committee Chairs and key managers continue.

Construction continues in all areas and floors of EC1 exterior and interior with the focus on the [redacted] and ground level facilities office (for advance HOL occupancy). All EC asphalt work was completed and parking lights supplied by HOL installed, concrete sidewalks continue. EC2 exterior works are near completion and the construction is concentrated on the interior finishing and system distributions. EC3 is awaiting final gas hook up to heat and complete the remaining interior works. EC system(s) commissioning commenced and HOL training plans have been developed.

The South Campus construction, and specifically the roofing/envelope systems, have been impacted by the unseasonable cold and wet weather. However, Sullivan was able to complete the asphalt work, and is close to completing the warehouse and garage roof panels. Interior office work has advanced with all wall framing, mechanical electrical distributions near completion. Drywall and ceiling systems will commence shortly. Sullivan and their trades are working overtime and over the holidays to hold to schedule. The MOE issued a draft approval which permits work to proceed, however HOL and verTerra are dealing directly with the Senior MOE staff on several conditions within the draft MOE approval which are deemed unacceptable to HOL.

Key Construction Stats:

- ➢ 80% complete based on billings ending November 30th, 2018 (including cash allowances)
- ➢ No Lost time accidents over 690 days
- ➢ Average manpower on site 100-150 (both sites)
- ➢ +15,000m3 of concrete poured to date

[redacted]

HydroOttawa

Executive Status Report

Facility Renewal Program

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  ○ EC1 drywall, ceilings, painting, flooring, millwork, and interior glazing systems
  ○ M&E main plant rooms near completion – heating system running for temp. heat
  ○ EC1 POD and UPS installation commenced
  ○ EC1 technology infrastructures and equipment (all levels)
  ○ [redacted]
  ○ HOL dark fiber tested
  ○ EC sidewalks, curbs and asphalt
  ○ EC Hunt Club road work/ intersection
  ○ EC2 office finishing
  ○ EC3 finishing/trims
  ○ SC roof panels, membrane roofing, M&E distributions , office wall framing, asphalt and concrete sidewalks
  ○ SC Solar foundation commenced
• Furniture systems ordered (levels 0, 3 and 4)
• Fitness equipment ordered
• OPS/Warehouse racking systems ordered
• Food Services tender closed and evaluation commenced
• Operational Logistical (moving) reassessed
• Signage/Lobby Graphic and Wayfinding in design and production
	• HOL furniture fit-up of 4th floor system office and facilities offices
	• EC1 drywall, ceiling tiles, painting, mechanical /electrical equipment and distributions, flooring, millwork and speciality items
	• EC emergency power system commissioning
	• [redacted]
	• EC1 Data Hall commissioning
	• EC1 technology systems
	• EC2 envelope and concrete in garage, office drywall/ceiling and M&E distributions
	• SC envelope and concrete in garage and office drywall/ceiling , M&E distributions
	• SC site-works (sidewalks, pump house)
	• SC solar foundations complete and racking commencing
	• Furniture orders continuing
	• HOL advance occupancy (Facilities and IT staff)
	• EC1 commissioning

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, specifically with continued staff engagement activities planned for 2019; • Weather risk for South Campus roofing • Compression affect (multiple trades and HOL fit up simultaneously) • HOL occupancy readiness (systems integration, processes/policies and staff focus).	• Revised HOL Policy and work processes efficiency gains.

HydroOttawa

Executive Status Report

Facility Renewal Program

Budget Status

- 80% complete based on billings ending September 30th, 2018
- $77M expended to date including land
- $51.1M on the design build program (80%)
- $6.1M forecast against contingency to date
- $.584M (less than 1%) contingency remaining to complete

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Dec 10th, 2018	Revised Forecast Dec. 10th, 2018	Invoiced To Date Nov. 30th, 2018	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (869,321)	$ 2,857,364	$ 3,007,431	105%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,467,500	$ 4,795,740	$ 2,569,795	54%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 5,073,899	$ 63,861,215	$ 51,122,807	80%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 964,419	60%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (575,000)	$ 3,450,000	$ 32,000	1%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,102,080)	$ 584,512	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 77,027,452**	80%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 15th, 2019.

Milestone Schedule & Status			
Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	**Nov. 30th-018**	Complete
EC Solar Array	Jan. 10-19	**March 019**	equipment procured
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	100% complete
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	100% complete
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	100% complete
EC3 Enclosed (Watertight)	Dec. 11-017	**Nov 1rst. 2018**	100% complete
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	100% complete
SC Structure Enclosed (Watertight)	Oct. 24-018	**Dec. 19th 2018**	***Revised date per MSSL***
SC Solar Array	Jan. 15-019	**Mar-19**	***Revised date per MSSL***
East Campus Early Occupancy	Jan. 2019	**Jan. 2, 2019**	
HOL Fit-Up & Migration	Jan-June-019	**January to May 15th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**April 8th 2018**	***Revsised Date per MSSL***
Final Completion of DB Contract	Jun. 26, 2019	**June 8th 2019**	*Under Review*
HOL Operational	Jul. 2, 2019	**May 15th, 2019**	*Planned Date*

Executive Status Report

Facility Renewal Program

Site Photos:

EC1 Hunt Club Elevation

EC2 *(parking lot asphalt and light standards complete)*

HydroOttawa

Executive Status Report

Facility Renewal Program

EC1 HOL Data Hall POD

EC1 Polished Concrete in Kitchenettes

Executive Status Report

Facility Renewal Program

EC1 Main Kitchen Walk-In Freezers

EC1 Washroom floor/wall tile

Executive Status Report

Facility Renewal Program

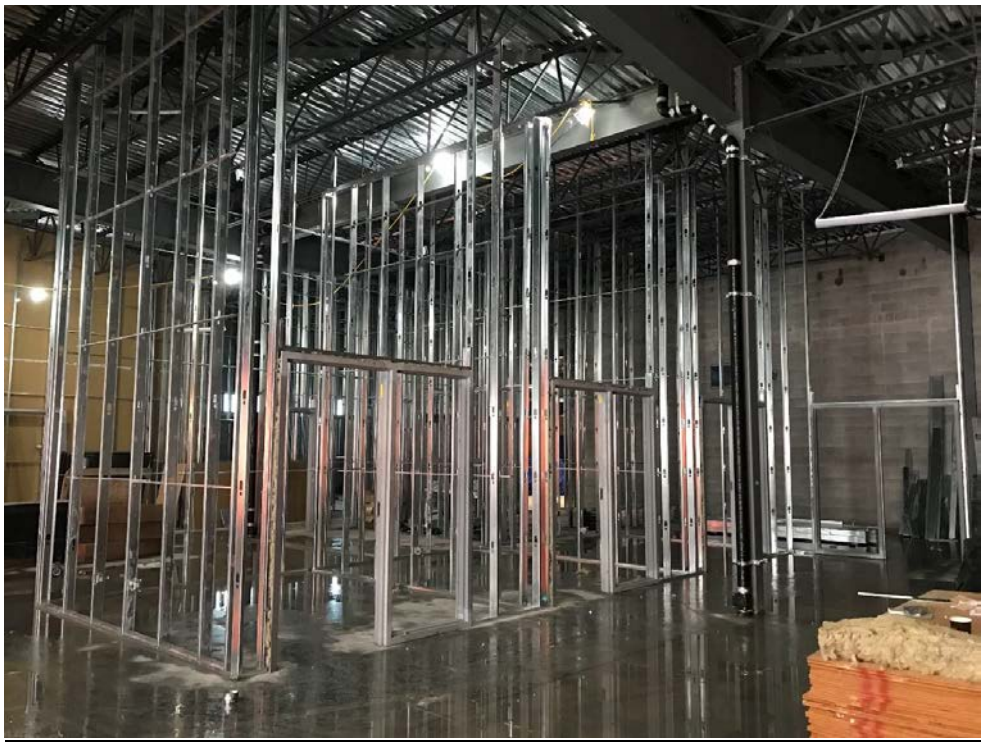
South Campus – Buildings west elevation

SC East road asphalt base coat

Executive Status Report

Facility Renewal Program

SC Office Area wall framing:



Executive Status Report

Facility Renewal Program

Report #	**23**
Date of Report	**January 15th, 2019**
Report Period	**December 15th , 2018 to January 15th, 2019**

Executive Summary

The FRP program is 84% complete, on budget and on schedule.

Construction is now in the final stage of completion with focus on completing the interior finishes of the East Campus, for City occupancy inspections March 8th, 2019, and the South Campus interiors scheduled for occupancy April 8th, 2019. Substantial completion of the contract (both sites) is scheduled for April 19th, 2019. Sullivan crews worked over the Christmas holidays on the South Campus and the roofs and the critical envelope systems were completed and heat brought into the garage for the interior concrete work. Additionally, crews worked on the interior walls and high works in the HOL warehouse. The South Campus MOE ECA approval was closed off this period aided by HOL's CEO intervention with Senior MOE officials. Solar foundations were completed on the South Campus and foundations commenced on the East Campus last week. All solar racking and panels systems are now on site for both projects.

Key Construction Stats:

- 86% complete based on billings ending December 31rst, 2018
- No lost time accidents over 720 days
- Average manpower on site 100-150 (both sites)

Advanced HOL migration works continued this period with installation of staff furniture systems in the system office and facilities offices in EC1, technology systems [redacted] For the next three months there will be an overlap of HOL's fit-up and Sullivan's works on both sites adding compression complexity and risk to the project and requiring effective and structured communications and increased project management. The main focus of the FRP now shifts to HOL's operational migration, change management and operational readiness to ensure an efficient and seamless assumption of the new facilities by HOL.

HOL's operational migration plan has been established and, in summary, is sequenced as follows:

1. Completion of HOL IT Data Hall, systems and networks in EC1
2. [redacted]
3. [redacted]
4. Decant Merivale exterior warehouse materials to temporary supports at Merivale yard
5. Relocate Merivale existing exterior racking systems to South Campus (install and certify)
6. Install new interior South Campus warehouse racking systems
7. Install new interior South Campus operational racking systems
8. Install new interior East Campus operational racking systems
9. Install new East Campus exterior yard racking systems
10. Fit-Up South Campus Metering and Transformer shops
11. Relocate exterior Merivale Warehouse materials
12. Relocate interior Merivale Warehouse materials
13. Migrate Operational Teams
14. Migrate Staff Teams.
15. Exit Albion (no later than June 1, 2019)
16. Relocate Merivale System Office consoles to Bank St.
17. Exit Merivale (no later than September 30th, 2019).

A detailed schedule for the above has been developed but remains dynamic as many of the above migration activities occur simultaneously and are interdependent with concurrent construction activities. However, in general, operational migration work will commence January 28th and be completed April 14th, followed then by the staff moves commencing April 26th, 2019 with HOL fully migrated by May 13th, 2019. From a Change Management perspective, all supporting activities necessary for HOL's occupancy will need to be in place and operational by April

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Facility Renewal Program

1rst, 2019, including signage/wayfinding, food services, fitness, health & wellness, staff training, etc. Detailed communications and move kits for the staff moves will be developed to support a seamless staff transition.

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  o EC1 interior finishes all levels
  o EC2 interior finishes
  o EC3 finishing
  o SC interior partitions, mechanical/electrical distributions, garage concrete.
• EC1 main emergency power systems (generators and UPS) load tested and commissioned – stable power now on for HOL IT system fit-up.
• SC roof and garage roof, main office envelope systems completed
• SC MOE permit (ECA)
Key HOL works completed this period:
• [redacted]
• All system furniture ordered for L 1,2,3
• System office display screens installed
• EC1 fibre demarcation and IT room racks and vertical and horizontal cabling all levels
• EC1 Data Hall POD installed, commissioning underway
• Warehouse and Operational racking systems being manufactured
• Warehouse migration logistic (move) services scope finalized and a warehouse move plan established
• EC1 lobby graphic design development continued with the target to close by the end of January
• The Food Service procurement evaluation was completed and the Successful proponent selected
	• EC interior construction finishing/trims and specialities all levels / areas
	• SC interior construction walls/ceilings, m&e distributions and garage concrete
	• HOL furniture fit-up level 3 an 2
	• Order all remaining speciality furnishings
	• System Office console installations (delayed to Jan. 23rd-019 by manufacturer).
	• EC1 IT Team deployment and system installations; fibre and switches,
	• EC1/2/3 – technology installations
	• EC1 solar foundations
	• SC solar racking installations
	• Relocate Merivale exterior racking to SC yard area
	• Close Food Services contract (HOL)
	• Change Management and occupational readiness plans (HOL).

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, specifically with continued staff engagement activities planned for 2019; • Compression affect (multiple trades and HOL fit up simultaneously) • HOL occupancy readiness (systems integration, processes/policies and staff focus).	• Revised HOL Policy and work processes efficiency gains. • Facility

Executive Status Report

Facility Renewal Program

Budget Status

- 84% complete based on billings ending December 31rst, 2018
- $81.5M expended to date including land
- $55.3 M on the design build program (86%)
- $6.1M forecast against contingency to date
- $.543M (.71%) contingency remaining to complete

Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Jan. 10th, 2019	Revised Forecast Jan. 10th, 2019	Invoiced To Date Dec. 31rst, 2018	% Complete
Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (869,321)	$ 2,857,364	$ 3,007,431	105%
HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,467,500	$ 4,795,740	$ 2,569,795	54%
Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 5,114,657	$ 63,901,973	$ 55,268,255	86%
Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 997,349	62%
FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (575,000)	$ 3,450,000	$ 282,000	8%
HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,142,838)	$ 543,754	$ -	0%
Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 81,455,830**	84%
Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 15th, 2019.

Milestone Schedule & Status

Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	**Nov. 30th-018**	Complete
EC Solar Array	Jan. 10-19	**April 14th, 2019**	***Revised date per MSSL***
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	100% complete
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	100% complete
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	100% complete
EC3 Enclosed (Watertight)	Dec. 11-017	**Nov 1rst. 2018**	100% complete
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	100% complete
SC Structure Enclosed (Watertight)	Oct. 24-018	**Dec. 27th, 2018**	100% complete
SC Solar Array	Jan. 15-019	**Apr-19**	***Revised date per MSSL***
East Campus Early Occupancy	Jan. 2019	**March 8th, 2019**	***Revised date per MSSL***
HOL Fit-Up & Migration	Jan-June-019	**January to May 13th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**April 19th, 2019**	***Revised date per MSSL***
Final Completion of DB Contract	Jun. 26, 2019	**June 8th 2019**	*Under Review*
HOL Operational	Jul. 2, 2019	**May 13th, 2019**	*Planned Date*

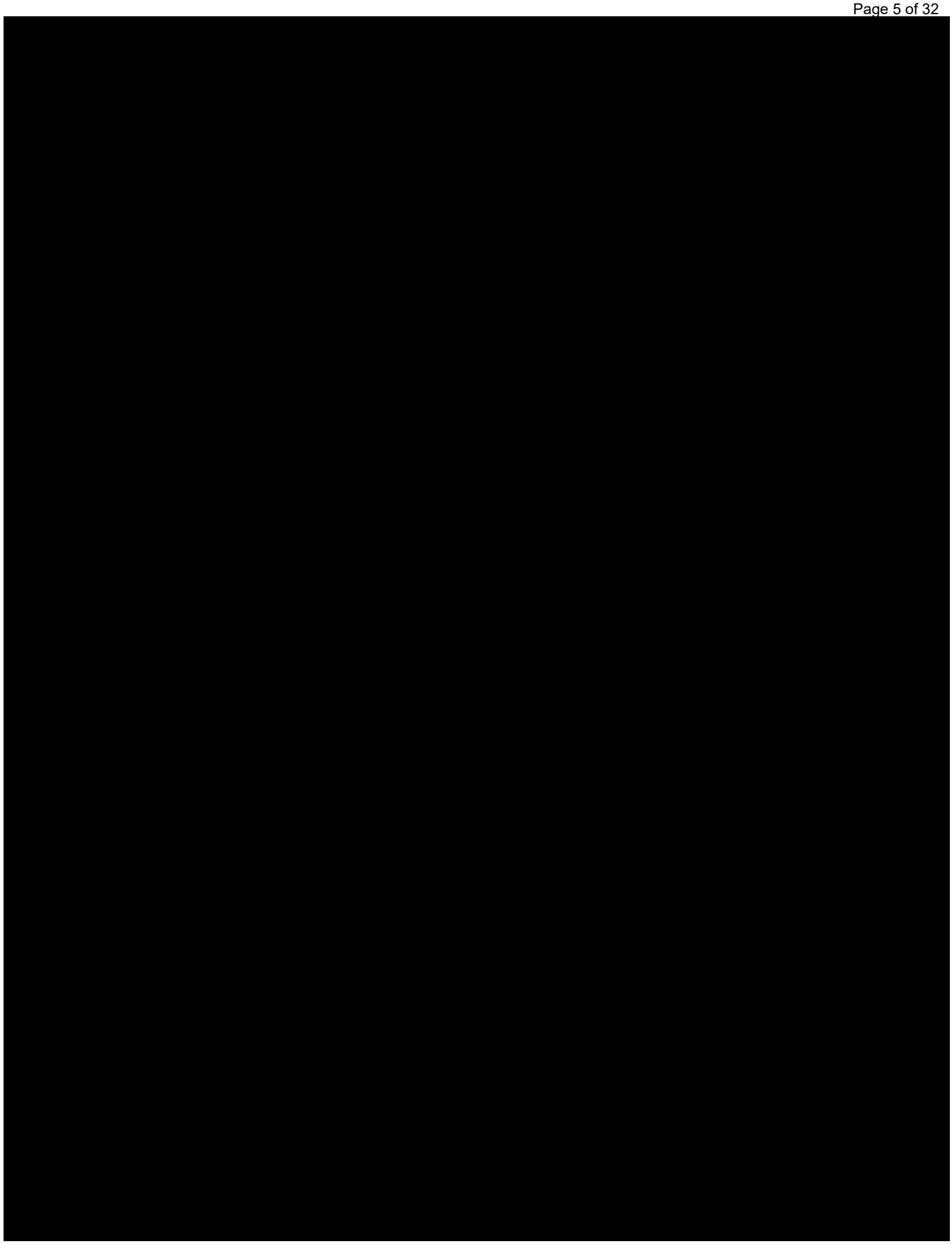
Executive Status Report

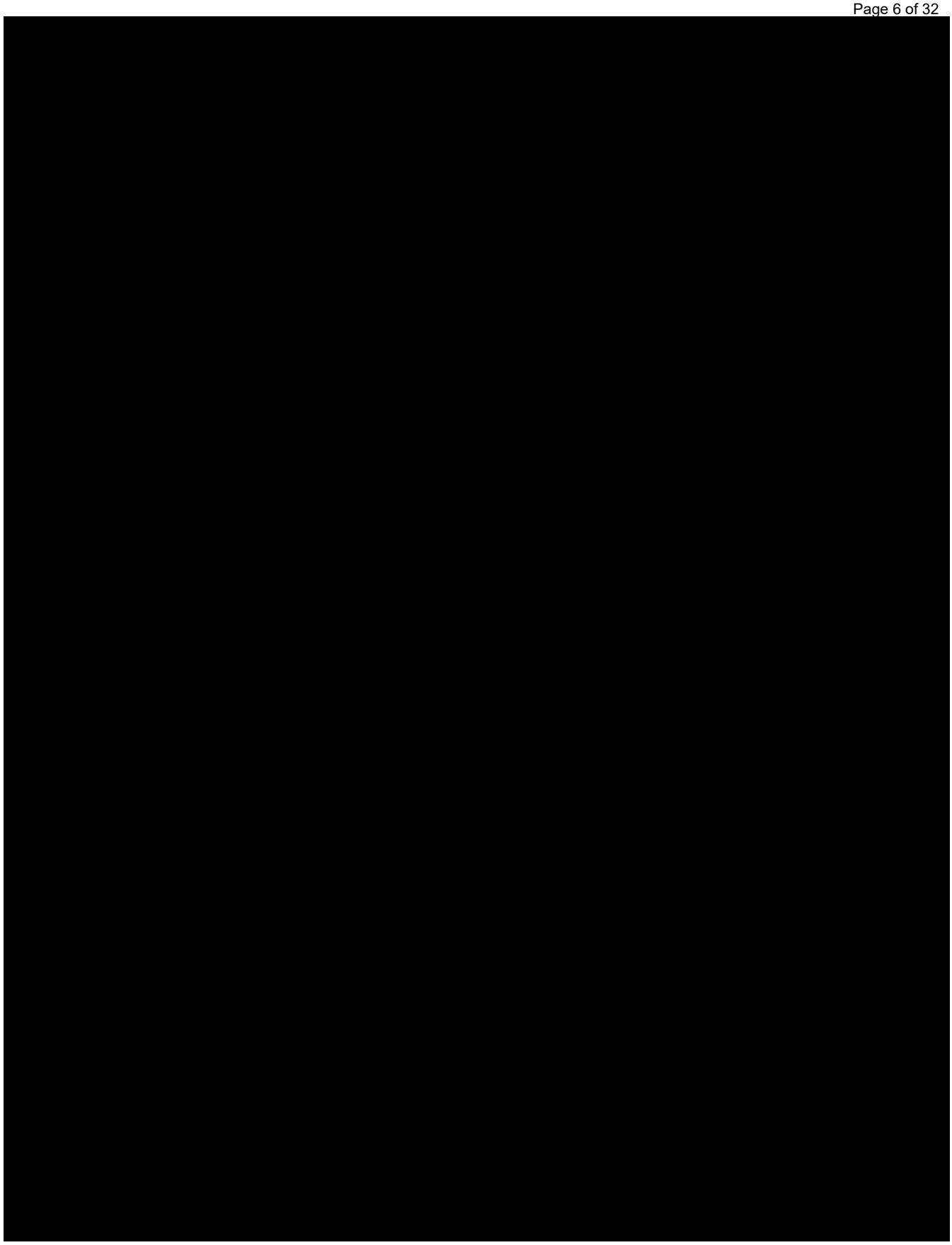
Facility Renewal Program

Site Photos:

East Campus

EC1 Exterior Elevations:

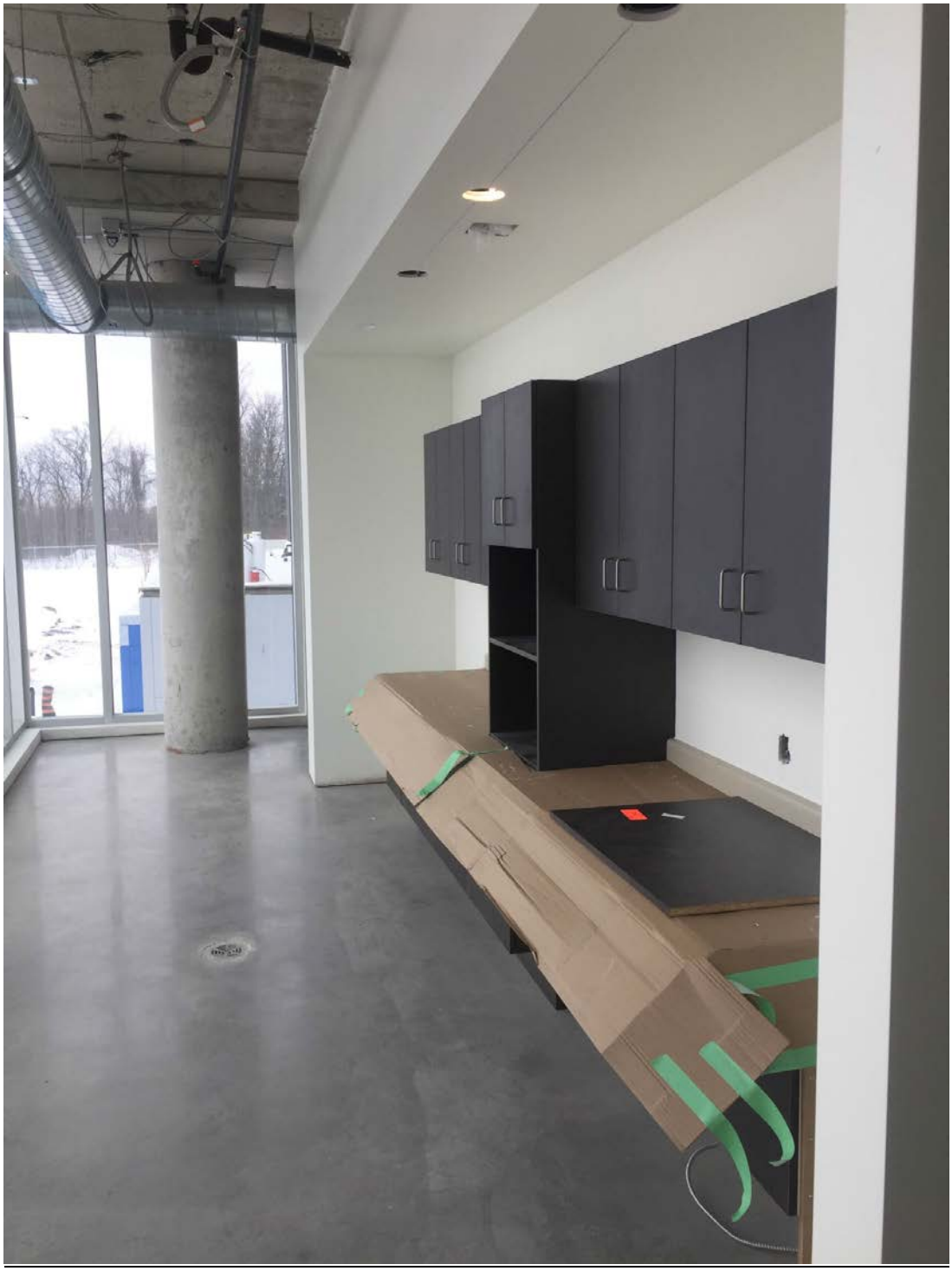




Executive Status Report

Facility Renewal Program

EC1 Millwork at Kitchenettes



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Facility Renewal Program

EC2 Elevations:

EC2 Interiors:

Garage:

Kitting Bays:

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Facility Renewal Program

South Campus:

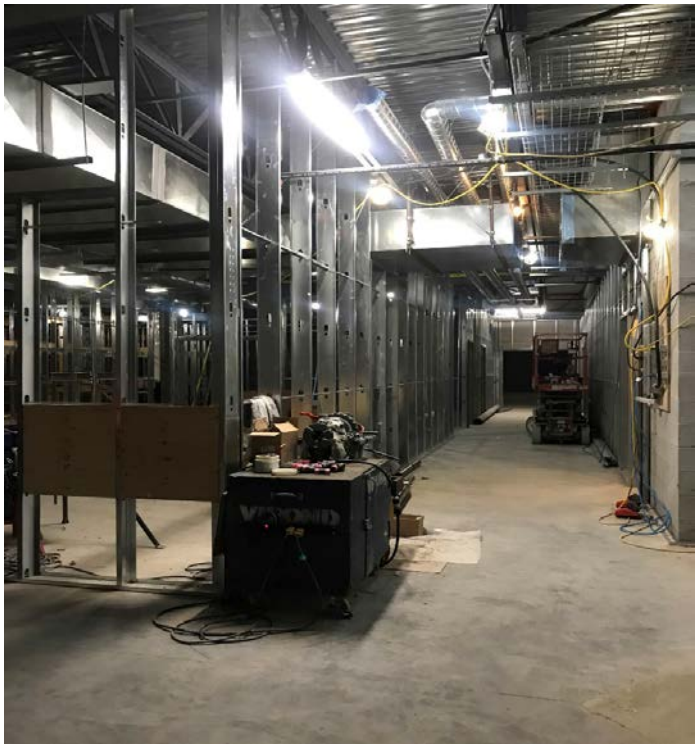
Roof and Envelope complete

Water storage/pump house

SC Interiors:

Main Electrical room

Interior wall framing



Executive Status Report

Facility Renewal Program

Report #	**24**
Date of Report	**February 15th, 2019**
Report Period	**January 15th , 2018 to February 15th, 2019**

Executive Summary

The entire FRP program is 88% complete, on budget and on schedule.

Construction is rapidly nearing completion on the East Campus with City final occupancy inspection scheduled for March 8th, 2019. Work in EC1, EC2 and EC3 is concentrated on interior finishing, but also commissioning of the base building mechanical and electrical life safety systems. The South Campus construction is being phased to advance HOL priority areas – warehouse, metering and transformer shop. The SC garage concrete work is substantially completed and the office and support areas well advanced. Permanent power is scheduled for February 15th. The solar array on the south campus began racking and panel installations. The East Campus solar foundations were completed and the racking crews will shift from the south when completed. verTerra and Sullivan have set the expectations for HOL occupancy, and while the intent is to complete as much work as possible, some exterior works, such as final landscaping and other weather dependent works, may have to be completed after HOL occupancy in May, when the frost is out of the ground.

Key Construction Stats:

- Construction is 90% complete based on billings ending December 31rst, 2018
- No lost time accidents over 751 days
- Average manpower on site 100-150 (both sites)

This month HOL IT "went live" with their network system in EC1 – a major milestone! HOL [redacted] main IT rooms and continued to build out the network systems. Technology equipment, Audio Visual, Security, WIFI are all in progress and proceeding on schedule. [redacted] Furniture systems were installed on [redacted], 3rd floor open areas, meeting rooms and offices, with the 2nd floor in progress. All teams are working in collaboration and are managing the complexity of simultaneous construction and operational fit-up. On the South Campus, the exterior yard racking began installation (existing racking relocated from Merivale), and new interior warehouse racking commenced.

On change management, the main focus is now on planning for and implementing the HOL migration and the multitude of activities involved operationally to make this happen. The food services contract was closed this period and verTerra will now work with the HOL/ Provider to ensure a successful start-up in April prior to full occupancy. Move coordination meetings commenced this week and will continue until HOL fully migrated.

There are no large risks foreseen at this time that will impact the construction or migration plans, however managing the schedule South campus and the final City inspections and occupancy certifications, which often expose unforeseen issues, are critical for the team.

[redacted]

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Executive Status Report

Facility Renewal Program

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Continued Construction:
  ○ EC1 interior finishes all levels
  ○ EC2 interior finishes
  ○ EC3 finishing
  ○ SC interior partitions, mechanical/electrical distributions, garage concrete.
Key HOL works completed this period:
• HOL IT network installed and energized
• [redacted]
• Furniture installed EC1 L3, L2
• All furniture ordered
• Continued technology distributions, terminations, equipment (all buildings)
• Merivale yard racking decommissioned and installed at the South Campus
• SC interior warehouse racking commenced
• The Food Service contract finalized
• Miscellaneous appliance tender commenced.
	• EC1/EC2 7 EC3 interior construction finishing/trims and specialities all levels / areas
	• City of Ottawa Occupancy Certification (March 8th, 2019)
	• SC interior construction walls/ceilings, m&e distributions and garage concrete
	• HOL furniture fit-up levels 2 and 1
	• Fitness equipment in EC1
	• EC1/SC solar array installations
	• System Commissioning and HOL staff training commencing
	• EC1 Thermal Scan of envelope
	• EC1 random acoustic sound testing
	• Preparation for administrative close on the Design Build contract (certification of substantial completion)
	• EC1 HOL IT and technology installations
	• Change Management and occupational readiness plans (HOL).

Significant Risks / Challenges	**Significant Opportunities**
• HOL contingency and change order management, specifically with continued staff engagement activities planned for 2019; • Compression affect (multiple trades and HOL fit up simultaneously), specifically the South Campus. • HOL occupancy readiness (systems integration, processes/policies and staff focus). • Unforeseen City Inspection requirements for occupancy.	• Revised HOL Policy and work processes efficiency gains.

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Executive Status Report

Facility Renewal Program

Budget Status

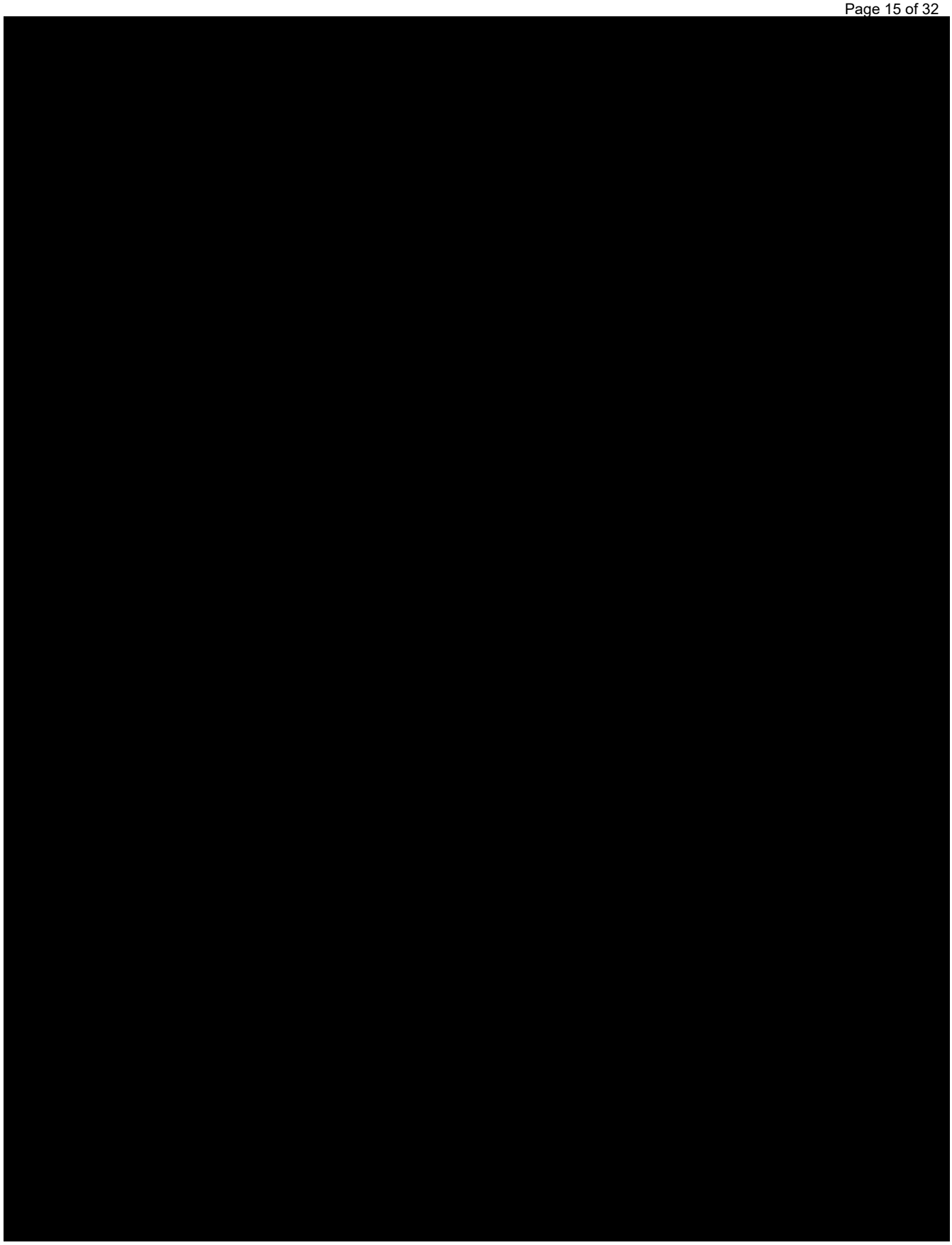
- Entire FRP Program 88% complete based on billings ending January 31rst, 2019
- $84.6M expended to date including land
- $57.6 M on the design build program (90%)
- $6.18M forecast against contingency to date
- $.5M (.66%) contingency remaining to complete

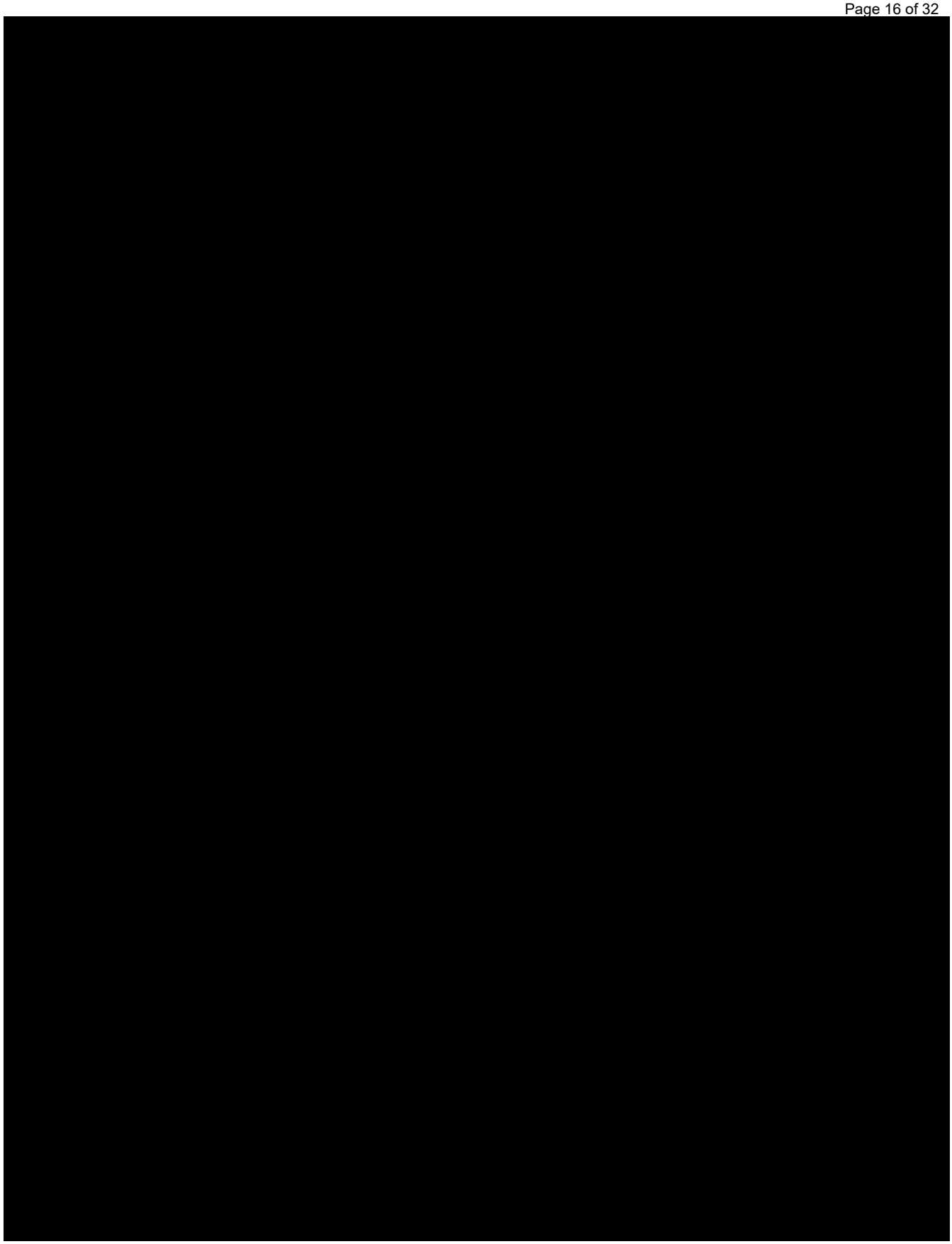
Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Feb. 11th, 2019	Revised Forecast Feb. 11th, 2019	Invoiced To Date Jan. 31rst, 2019	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (869,321)	$ 2,857,364	$ 2,293,602	80%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,359,970	$ 4,688,210	$ 3,835,334	82%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 5,260,780	$ 64,048,096	$ 57,612,496	90%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 1,268,502	78%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (575,000)	$ 3,450,000	$ 282,000	8%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,181,432)	$ 505,160	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 84,622,933**	88%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 15th, 2019.

Milestone Schedule & Status			
Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	**Nov. 30th-018**	Complete
EC Solar Array	Jan. 10-19	**April 14th, 2019**	***Revised date per MSSL***
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	100% complete
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	100% complete
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	100% complete
EC3 Enclosed (Watertight)	Dec. 11-017	**Nov 1rst. 2018**	100% complete
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	100% complete
SC Structure Enclosed (Watertight)	Oct. 24-018	**Dec. 27th, 2018**	100% complete
SC Solar Array	Jan. 15-019	**Apr-19**	***Revised date per MSSL***
East Campus Early Occupancy	Jan. 2019	**March 8th, 2019**	***Revised date per MSSL***
HOL Fit-Up & Migration	Jan-June-019	**January to May 13th 2019**	*VTC schedule*
Substantial Completion of DB Contract (EC & EC)	May 2, 2019	**April 19th, 2019**	***Revised date per MSSL***
Final Completion of DB Contract	Jun. 26, 2019	**June 8th 2019**	*Pending deficiency status.*
HOL Operational	Jul. 2, 2019	**May 13th, 2019**	*Planned Date*





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Facility Renewal Program

Level 3 workstations

EC1 Lobby Lights (retracted position – will hang down in Atrium)

EC1 Main entrance walkway:

EC2 Interiors:

Change Room Lockers

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Facility Renewal Program

South Campus:

Exterior Yard Racking

Solar Array

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Interior Warehouse Racking

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Facility Renewal Program

Report #	**25**
Date of Report	**March 22th, 2019**
Report Period	**February 15th to March 20th, 2019**

Executive Summary

The FRP program is 89% complete, on budget and on schedule.

On March 1rst, 2019, the EC2 and EC3 buildings were certified by the City of Ottawa for occupancy. On March, 8th, 2019 EC1 was certified for occupancy, with permits issued for all buildings. This was a major milestone for Sullivan and the entire project team, and allows HOL to proceed with advance migrations without personal protection equipment in the buildings and ahead of substantial completion date of April 19th, 2019. While finishing work continues, mostly in EC1, the level of effort by Sullivan and the trades to obtain all three occupancy permits by early March was significant.

Unfortunately, on the morning of Wednesday, March 13th (+/- 4am) a flood occurred in the EC1 building that impacted levels 3, 2,1 and a part of level 0. A 6" chilled water line gasket failed on Level 3, (the gasket was subsequently deemed defective) and water flooded level 3, then made its way down to the lower levels. The water line and gasket had been inspected and certified and the system was circulating water for months (under low pressure as the air conditioning system not required). The water damage extended mostly to the core areas on Levels 3, 2 and 1, with almost no damage to Level 0. Sullivan mobilized their insurance company and a restoration company within 2hrs and the water pumped and building dryers installed the same day. Sullivan is obligated to provide HOL as new building and the restoration company follows insurance industry restoration guidelines to ensure this. Moisture readings and mapping have been completed and all areas, drywall, ceilings, flooring, etc., requiring replacement have been removed, and are now in the process of being restored (based on approved indication from the Restoration company). An Industrial Hygienist, contracted independently of the Restoration company, will also investigate and provide a report on the restoration. Further an Interior Air Quality Test of all buildings will be performed post restoration. Damages to HOL equipment specifically Audio Visual systems (ie: screen displays, cabling and devices) and furniture systems was realized which have now been reordered. A complete damage assessment is in progress but fortunately no damage to HOL's operating network equipment or the nearly completed System Office occurred. While this was an unfortunate event, the fact that no one was hurt, no live HOL network system was affected and that it occurred prior to HOL's full staff occupancy can be considered as large positives. Sullivan has assessed the schedule for restoration and forecast completion of the restoration by April 5th, 2019, which will not impact HOL's migration plan. HOL, verTerra and Sullivan will wrap up the insurance end of this once all costs and damages are defined.

Construction, including flood related restoration, is rapidly nearing completion on the East Campus and the focus now is to complete the works necessary for HOL's advance migrations commencing [redacted] and Operations on April 15th.

The South Campus construction has been impacted by the discovery of incorrect secondary cables installed from the transformer to switchgear which delayed permanent power by a month. However, this has now been corrected and permanent power energized Tuesday March, 19th. Sullivan has been directed to recover the time loss within schedule as HOL cannot alter the warehouse and operational migration plan. Sullivan has now commenced extended shifts and has increased key trade manpower to maintain the occupancy target of April 8th, 2019. This is completely a Sullivan risk and is being monitored daily by verTerra. However, construction work did continue over the last period without permanent power, and the key areas required by HOL (warehouse, metering and transformer shop) advanced well.

The solar project realized a slight delay due to weather and ground conditions and the South Campus will now be complete by the mid-April and the East Campus by April 26th.

For both campuses verTerra is working closely with Sullivan to determine what areas of the contract will not be completed by substantial completion (April 19th, 2019) and what systems need to be in place for HOL occupancy and operations. There will be some overlap with the construction work and HOL operations during the advance migration stage (April 7th to April 26th), but the intent remains to complete all work, not weather dependent, by April 19th, and

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Facility Renewal Program

prior to HOL's first main staff move on April 26th. The largest risk to schedule at this time is Sullivan achieving municipal occupancy for the South Campus. However, HOL can still proceed with their operational migration without a municipal occupancy permit but HOL staff will be required to comply with increased safety requirements including full-time PPE.

Key Construction Stats:

- Construction is 91% complete based on billings ending February 28th, 2018
- No lost time accidents over 781 days
- Average manpower on site 100-150 (both sites)

HOL IT continued their network migrations to EC1 successfully with almost all systems now in place at EC1. [redacted] Technology equipment, Audio Visual, Security, WIFI are all in progress and proceeding on schedule, except where impacted by the flood (damaged equipment has been reordered). Furniture systems and the installation schedule were also impacted by the flood, and all work on Levels 3, 2 and part of Level 1 had to stop due to the flood damage and restoration. However, we have reordered all irreparable furniture, and have been able to store newly delivered furniture systems in the building, so that when the restoration is complete we will increase the furniture manpower to recover schedule loss. Warehouse and operational racking/shelving systems in both the East and South Campuses will be complete by March 31rst.The operational migration is set to commence April 4th, starting with the metering and exterior yard stores, followed immediately by the interior warehouse and then operations. The Operational migration will be complete by April 15th.

On change management works, the Lobby Graphic will commence installation this week, the food service equipment is installed and commissioned and the food service contract set to commence operations April 15th, with vending advanced for the System Office team on April 7th. Move coordination meetings continue and all move lists are now competed. Staff pre-move orientation tours are planned for mid-April. HOL teams are working on the communications, move kits, training, graphic display and wayfinding design, and all related P4 policies and procedures necessary for occupancy.

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Construction:
  ○ EC1 municipal occupancy achieved; interior finishing works continue
  ○ EC2 municipal occupancy achieved; minor finishing works continue
  ○ EC3 municipal occupancy achieved; minor finishing works continue.
  ○ SC interior partitions/ceilings, paint, flooring, mechanical/electrical distributions all areas.
  ○ Solar panels, electrical and fencing at SC and foundations and racking at the EC.
Key HOL works completed this period:
• HOL IT sub-network system migrations
• [redacted]
• Furniture deliveries and installations
• Continued technology distributions, terminations,
	• Flood restoration completed
	• Finishing work EC near completion
	• SC municipal occupancy
	• Technology systems near completion
	• Security systems complete
	• EC1 Lobby Graphic completed
	• [redacted]
	• Furniture continued (near completion)
	• Fitness Equipment in EC1 and SC
	• Food Service & vending start up
	• HOL OPS migration completed
	• SC interior construction walls/ceilings, m&e distributions and garage concrete
	• EC1/SC solar array installations
	• System Commissioning and HOL staff training commencing
	• Preparation for administrative close on the Design

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equipment (all buildings) • Racking and shelving systems in both buildings and yards • The Food Service coordination meetings occurred • Graphic signage commenced with glazing films /room names completed (all buildings)	Build contract (certification of substantial completion) • Change Management and occupational readiness plans (HOL).
Significant Risks / Challenges	**Significant Opportunities**
• EC1 flood restoration work schedule and insurance wrap up/ settlement • South Campus construction and system commissioning schedule • South Campus municipal occupancy approval • HOL occupancy readiness (systems integration, processes/policies and staff focus).	• Revised HOL Policy and work processes efficiency gains and leveraging new facilities to fullest potential.

Budget Status

- Entire FRP Program 89% complete based on billings ending February, 28th, 2019
- $85.4M expended to date including land
- $58.2 M on the design build program (91%)
- $6.28M forecast against contingency to date
- $.4M (.53%) contingency remaining to complete

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Mar. 10th, 2019	Revised Forecast Mar. 10th, 2019	Invoiced To Date Feb. 28th, 2019	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (869,321)	$ 2,857,364	$ 2,343,536	82%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,381,860	$ 4,710,100	$ 3,885,418	82%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 5,340,636	$ 64,127,952	$ 58,183,148	91%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 1,371,362	85%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (575,000)	$ 3,450,000	$ 292,538	8%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,283,178)	$ 403,414	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 85,407,002**	89%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

HydroOttawa

Executive Status Report

Facility Renewal Program

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 13th, 2019

Milestone Schedule & Status

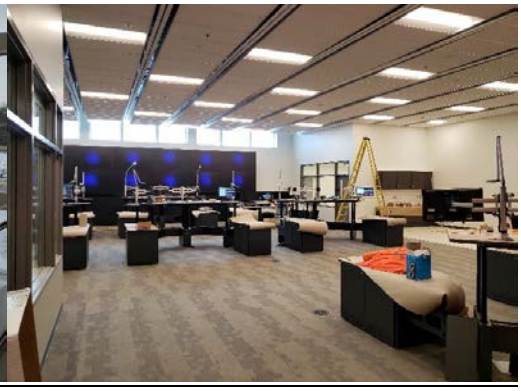
Activity	Milestone Date	Forecast Completion Date	Status
50% Design Submission to HOL	Nov. 17, 2016	-	100% complete
Site Plan Agreement Submission	Nov. 30, 2016	-	100% complete
75% Design Submission EC1 to HOL	Jan. 19, 2017	-	100% complete
Building Permit Submission to City (East Campus)	Jan. 23, 2017	-	100% complete
Committee of Adjustment Hearing EC1 Height	Mar. 15, 2017	-	100% complete
75% Design Submission EC2/EC3 & SC to HOL	Mar. 23, 2017	-	100% complete
Building Permit Submission to City (South Campus)	Mar. 24, 2017	-	100% complete
Construction Mobilization - East Campus	Mar. 27, 2017	-	100% complete
Construction Mobilization - South Campus	Mar. 27, 2017	-	100% complete
95% Design Submission to HOL	Apr. 13, 2017	-	100% complete
Site Plan Agreement Approval - East Campus	3-May-17	-	100% complete
Building Permits - East Campus	Jun. 14, 2017	-	100% complete
Site Plan Approval - South Campus	Jun. 26, 2017	Nov-15-017	100% complete
Building Permit - South Campus	Jul. 7, 2017	Nov-15-017	Conditional Permit
100% Design Completion (all buildings)	Aug. 4, 2017	Aug 3-017	100% complete
EC1- Concrete Structure Complete (Topped Off)	Dec. 14-17	Dec-7-017	100% complete
EC1- Enclosed (Watertight)	Mar. 26-017	June -1-018	*Main roof & exterior wall, except Atrim*
EC Hunt Cub Rd. & Access Rd improvements	Sept 7-18	Nov. 30th-018	Complete
EC Solar Array	Jan. 10-19	**April 26th, 2019**	***Revised date per MSSL***
EC2 Pre-Eng Garage Structure	Nov.2-017	Jan 31 018	100% complete
EC2 Enclosed (Watertight)	Aug. 8-018	**October 31rst-018**	100% complete
EC3 Pre-Eng Bldg. Structure	Nov. 13-017	Dec-7-017	100% complete
EC3 Enclosed (Watertight)	Dec. 11-017	**Nov 1rst. 2018**	100% complete
SC Structure (Pre-Eng & Structural Steel)	Aug. 10-018	Aug 30th-018	100% complete
SC Structure Enclosed (Watertight)	Oct. 24-018	**Dec. 27th, 2018**	100% complete
SC Solar Array	Jan. 15-019	**April 15th, 2019**	***Revised date per MSSL***
East Campus Early Occupancy	Jan. 2019	March 8th, 2019	*Milestone Achieved*
South Campus Occupany		**April 8th, 2019**	***Risk Item***
Substantial Completion of DB Contract (EC & SC)	**May 2, 2019**	**April 19th, 2019**	***Revised date per MSSL***
HOL EC1 System Office Live		**April 7th, 2019**	
HOL Metering & Warehouse Migration	**April 4th, 2019**	**April 15th, 2019**	
HOL OPS live in EC2 and SC		**April 15th, 2019**	
HOL Staff Moves	**April 26th, 2019**	**May 13th, 2019**	
HOL Operational	**Jul. 2, 2019**	**May 13th, 2019**	*Planned Date*
Final Completion of DB Contract	**Jun. 26, 2019**	**June 8th 2019**	*Pending deficiency status.*

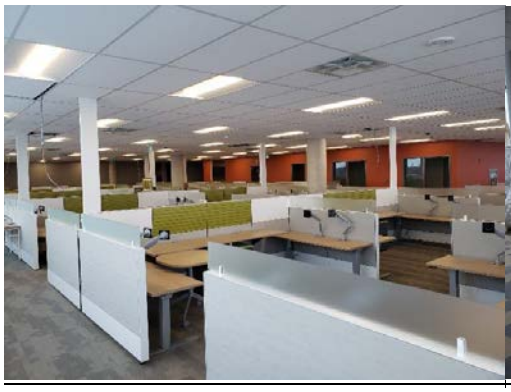
Executive Status Report

Facility Renewal Program

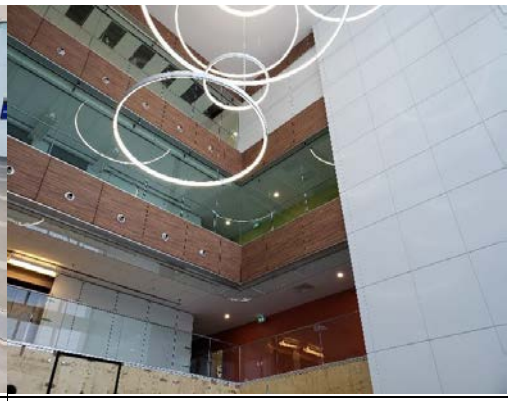
Site Photos:

EC1 Interiors:







Executive Status Report

Facility Renewal Program

EC2 Interiors:

Executive Status Report

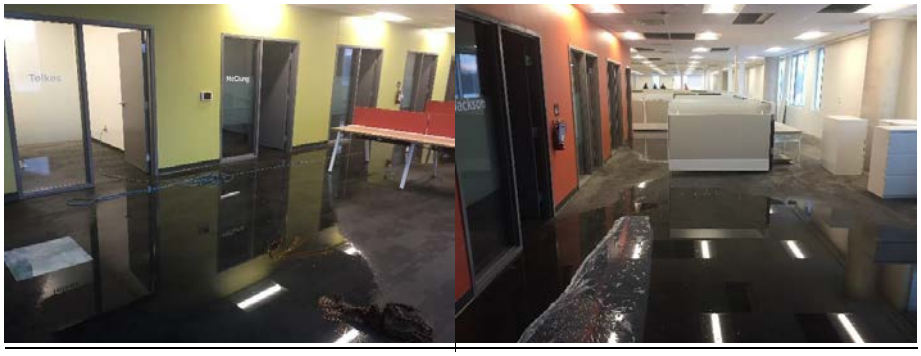
Facility Renewal Program

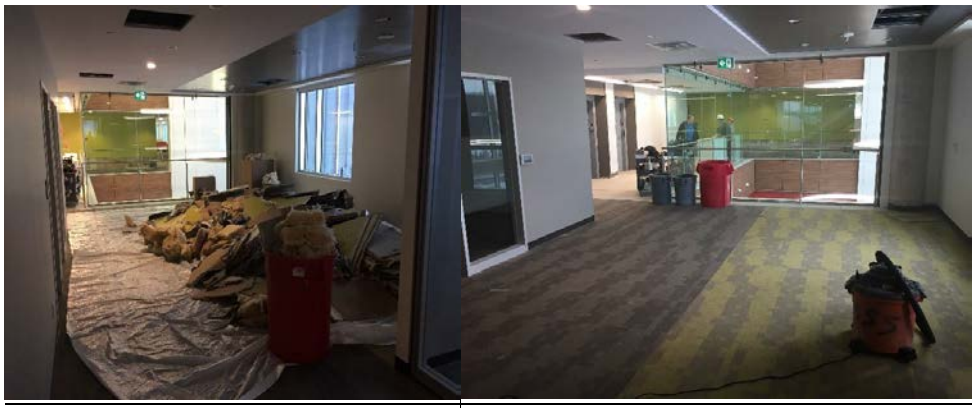
South Campus :

Executive Status Report

Facility Renewal Program

EC1 Flood Photos (sample):





Executive Status Report

Facility Renewal Program

Report #	**26**
Date of Report	**March 22th, 2019**
Report Period	**March 20th to May 6th, 2019**

Executive Summary

The FRP program is 95% complete, on budget and on schedule.

This period has been a very busy one with ALL team members stepping up to successfully achieve the following planned milestones:

1. The EC1 Flood restoration was completed [redacted]
2. [redacted]
3. Warehouse and yard migration completed at both Campuses on April 12th (2 days ahead of schedule);
4. South Campus Municipal Occupancy achieved Friday April 12th;
5. HOL Operational Staff & Fleet migrations at the South Campus and EC2 buildings Monday, April 15th;
6. HOL staff tours of the new EC1 building between April 15th and April 25th;
7. HOL's first staff move to EC1 (level 3) on April 29th, 2019;
8. HOL's National Day of Mourning held at the new EC2 garage on April 26th, 2019;
9. HOL's second staff move to EC1 (level 2) on May 6th.

Construction work advanced on both campuses sufficient to achieve occupancy and permit HOL to move in/operate from the new buildings in a phased approach and on schedule. However, construction, fit-up and system commissioning work, continues on both campuses which has created some interferences with HOL operations, and will continue to do so, until Sullivan and the fit-up is completed. HOL, verTerra and Sullivan have worked well together to manage this overlap period but as HOL's occupancy increases Sullivan's access becomes more restricted and less and less efficient for them, which is a motivator for them to complete. The forecast for all remaining contract work, including landscaping on both campuses, is mid to late June. HOL and verTerra have established a centralized management process to track all of Sullivan remaining works and deficiencies to this forecast. Sullivan has not, as yet, submitted their request for contract Substantial Completion but this is expected the week of May 13th, 2019.

The EC1 flood restoration was fully remediated by April 5th by Sullivan, however the delay of the flood did impact the technology and furniture scopes, which required overtime, including weekend shifts, to complete the fit-up and hold HOL's migration schedule. Recognition is warranted for all of the Technology and Furniture teams for their collective efforts in this regard.

The solar project has been further delayed, mostly due to weak performance management by the Solar contractor. Final completion and connection of the solar fields, including requisite utility and regulatory approvals, is forecast by the end of May.

Key Construction Stats:

- Construction is 95% complete based on billings ending April 30th, 2018
- No lost time accidents over 823 days
- Average manpower on site 100-150 (both sites) prior to April 12th, and has been gradually declining as the work is completed.

On Change Management, the move process, staff engagement and communications were well executed by HOL and anchored the success of the construction and fit-up work, building an excitement within HOL to move to the new facilities. Initial feedback from the staff moved into the facilities has been extremely positive, despite ongoing construction work.

[redacted]

Executive Status Report

Facility Renewal Program

[redacted]

Major accomplishments since last report	Upcoming major activities (4 week look ahead)

• Construction:
  ○ EC1 Flood restoration
  ○ SC municipal occupancy
  ○ EC1 construction and fit-out to levels 4, 3, and 2 to permit HOL moves
  ○ EC1 Kitchen
 	
• Key HOL works completed this period:
  ○ HOL IT sub-network system migrations
  ○ [redacted]
  ○ Furniture deliveries and installations
  ○ Technology & Security systems
  ○ Signage
  ○ Fitness area
  ○ Food Services commenced (soft start)
  ○ HOL staff migrations SC, EC2, EC1 L4, L3, L2
  ○ Time Capsule placed & capped
	• EC1 Level 1/ fit-up for last HO
	• EC/SC solar connection and EC1 carport
	• SC/EC landscaping (hard and soft)
	• System Commissioning and HOL staff training
	• Administrative close on the Design Build contract (certification of substantial completion)
	• Deficiency rectification
	• Security and technology system(s) fine tuning.

Significant Risks / Challenges	**Significant Opportunities**
• Overlap and interference between remaining construction work, system commissioning and HOL occupancy and operations • Final reconciliation/closure of the contract • Managing the need for change and or tweaks to the facilities, unless operationally deficient.	

Executive Status Report

Facility Renewal Program

Budget Status

- Entire FRP Program 95% complete based on billings ending April 30th, 2019
- $91.8M expended to date including land
- $63.2 M on the design build program (98%)
- $6.48 M forecast against contingency to date
- $.2M (0.27%) contingency remaining to complete

Budget Summary & Forecast								
ID	Category:	Approved Budget (April 2016)	Post Design Build Tender Revisions	Revised Post Tender Budget	Forecasted Revisions Apr. 30th, 2019	Revised Forecast Apr.30th, 2019	Invoiced To Date April 30th, 2019	% Complete
	Land	$ 19,331,000	$ -	$ 19,331,000	$ -	$ 19,331,000	$ 19,331,000	100%
	Professional Fees	$ 2,554,058	$ 1,172,626	$ 3,726,684	$ (719,321)	$ 3,007,364	$ 2,985,620	99%
	HOL Program Changes/Reallocations	$ -	$ 1,928,608	$ 1,928,608	$ 2,117,401	$ 4,445,641	$ 4,258,397	96%
	Design Build Costs	$ 58,742,825	$ 44,491	$ 58,787,316	$ 5,613,636	$ 64,400,952	$ 63,265,905	98%
	Cash Allowances	$ 5,690,600	$ (3,675,800)	$ 2,014,800	$ (394,630)	$ 1,620,170	$ 1,486,808	92%
	FF&E / Migration	$ 4,200,000	$ (175,000)	$ 4,025,000	$ (535,005)	$ 3,489,995	$ 546,148	16%
	HOL Contingency	$ 5,300,000	$ 1,386,592	$ 6,686,592	$ (6,481,714)	$ 204,878	$ -	0%
	Totals	**$ 95,818,483**	$ 681,517	**$ 96,500,000**		**$ 96,500,000**	**$ 91,873,878**	95%
	Approved HOL Capital	$ 96,500,000		$ 96,500,000		$ 96,500,000		

Schedule Status

- The project is forecast to be completed ahead of the original July 2019 schedule. Current forecast is to have HOL fully operational by May 13th, 2019

Executive Status Report

Facility Renewal Program

Site Photos:

South Campus: